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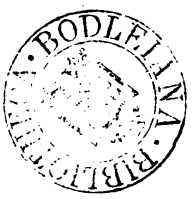
Salkeld
1883

MINUTES,
EXPERIMENTS, OBSERVATIONS,
AND
GENERAL REMARKS,
ON
AGRICULTURE,
IN
THE SOUTHERN COUNTIES;
A NEW EDITION.

TO WHICH IS PREFIXED
A SKETCH OF
THE VALE OF LONDON,
AND
AN OUTLINE OF ITS
RURAL ECONOMY:
NOW FIRST PUBLISHED.

By Mr. MARSHALL.



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ADVERTISEMENT.

THE MINUTES OF AGRICULTURE having been some years out of print, and the EXPERIMENTS and OBSERVATIONS concerning AGRICULTURE and the WEATHER being a continuation of the same record of experience, in the same department, and on the same farm, I now incorporate them, in one work; and print them on the plan, which I have uniformly adopted, in publishing the results of my experience, in other departments of the kingdom.

And, in order to show, with full advantage, the situation and natural circumstances, under which my practice, in this department, was pursued, and the established

customs and habits, out of which my experience arose, I have thought it right to preface the present edition, with a sketch of the VALE OF LONDON; in which the remarks, it contains, were written; and to give an outline of the established practice, which necessarily formed the groundwork of my own; thereby giving this the same advantage, as the other Registers of my experience; and, at the same time, bringing forward some particulars of management, which have occurred to my observation, in the environs of the Metropolis, and which have not, heretofore, been entered on record.

The present practice of rural economy in the Vale of London, is probably of long standing; and although it may be said, to be in some measure peculiar to the situation, in which it has originated, especially in the more immediate vicinity of the town; yet,

at the distance at which the practice, that gave rise to the following remarks, was carried on, the neighborhood of the Capital (unless in some few particulars) has less influence, than a stranger in it may imagine: as will be seen in the following outline; which, though it comprehends, generally, the Vale Lands under view, must be considered as more particularly belonging to the SOUTH-EAST QUARTER OF THE VALE.

ERRORS OF THE PRESS.

VOL. I.

P. 34. line 2, for *that* read *the.*
P. 293. l. 3, for *light* read *night.*
P. 298. l. 3 from bottom, for *eat* read *ate.*
P. 410. Conclusion, for *of few miles,* read *of a few miles.*

VOL. II.

P. 25. l. 7, *dele* a.
P. 53. l. 6. for *truth* read *truths.*
P. 54. l. 5, for *handlord* read *landlord.*
P. 60. Note, l. 4 from bottom, for *simpicity* read *simplicity.*
P. 77. Note, l. 8 from bottom, for *in year,* read *in the year.*
P. 85. l. 5, for *comprehend* read *comprehended.*
P. 245. l. 7 from bottom, for *langor* read *languor.*
P. 308. l. 8, for *observation* read *observations.*

A

SKETCH

OF

THE VALE OF LONDON.

THE SITUATION, of this wide spreading tract of Vale Lands, is between the Heights of Buckinghamshire, Middlesex, and Essex, on the north, and the Chalk Hills, and Heathlands of Surrey, on the south: the east end being closed, by Shooter's Hill in Kent, and the rising grounds of Essex; the west end, by Windsor Forest, and other hills of Berkshire; the Thames winding, with a devious course, through its area; dividing it into two nearly equal parts.

The OUTLINE, though irregular, partakes of the ellipsis or oval: the Metropolis being situated near its eastern focus.

The EXTENT may be estimated, by reckoning its longest diameter, at thirty-five miles, and its shorter, at twenty miles: thus giving an area of about five hundred square miles.

The ELEVATION of these vale lands, above the SEA, is remarkably small; considering their great distance from it. The tide flows several miles above the metropolis, notwithstanding this is situated near fifty miles from the mouth of the river. And, with respect to the ADJACENT COUNTRIES, their situation is likewise low: they are seen over, from eminences on almost every side, as a depressed vale district.

The SURFACE of the area, or base of the Vale, is singularly level. From Maidenhead Bridge, at the western extremity, to Greenwich, at the eastern, a considerable portion of the area has the unvaried flatness of waterformed lands: and much of it wears evident marks of that character. Below Chelsea, the southern banks of the river have been, demonstrably, formed by the tide;—are reclaimed mud banks. And, from thence, in a line to the western extremity, the only striking irregularity of surface is caused,

by the brooks and rivulets, which cross it: the entire area, in this direction, appearing, as if it had been formed, by the first subsidence of matter, suspended in, or moved by, the waters which covered it, at the time when the general surface of the Island received its present form. Remove the hillocks, with which it is beset, and the headlands that break in upon it, (and which are of inconsiderable extent, compared with the area in which they stand) the whole would appear as one extensive flat: such a one, indeed, for extent, as this Island can scarcely equal; excepting the fens and marsh lands on the Eastern Coast; and excepting the wide spread level of rich lands, formed by the concurrent Vales of the Trent, the Ouze, and other branches of the Humber. But this is an irregular, undefined extent of low country, lying, in some measure, open to the sea: whereas the VALE OF LONDON is a regular, inland, Vale District,—outlined by chains of hills, and watered by one river.

The principal hillocks, which rise in its area, and prevent its being obviously seen, in this light, are those of Harrow, the Sister

Hills, or Headlands, of Hampstead and Highgate, Black Heath, the Norwood or Sydenham Hills, those of Wimbledon and Richmond, and the rising ground, on which the Metropolis is happily situated: a site which has been chosen with singular judgment: or rather, shall we say, the site itself has rendered it, by a concurrence of natural circumstances, the Capital of the Island, and its principal seat of commerce.

REMARK. It is observable, that several of the principal towns of the Island, as London, York, Glocester, Maidstone, &c. &c. *stand near the extent of the tide,* in the rivers on which they are respectively situated. And, it is farther observable, that with respect to LONDON, there was no other situation, in which a large commercial town could stand, with equal propriety, than the rising ground, on which it is built. At the time when London first became a place of commerce, there was no other site, near the extent of the tide, that is to say, between Greenwich and Richmond, which could have answered the purpose; the banks of the Thames, above and below it, being, then, it is probable, mere mud banks, liable

to be overflowed by the tide, and shifted by the floods; whereas, the line of hill, the long down,* on which the metropolis is built, stood boldly on the banks of the river, and probably had, at that time, as at present, a pool of deep water lying immediately at its feet; while its soil, its water, and the natural woodlands in its immediate neighbourhood, rendered it singularly eligible, as the site of a great commercial town, in times past; and, in later days, a full and constant supply of fuel, added to an exhaustless source, on the spot, of materials, of the first quality, both for buildings and roads, have assisted in swelling it to its present size.

CLIMATURE. The base of the Vale is early, in its seasons; as will appear, in the following DESCRIPTION of the FARM. What

* It has frequently struck me, that the town owes its name to the site on which it was built; London being the most apt contraction of Longdon,—the ordinary contraction (as might be shown in numberless instances, in this part of the Island) of Longdown; which, in the Southern Counties, is still synonimous with Long Hill; and such the site of London, before it was covered with buildings, appeared from the river, and was the only one of the kind, in this part of its course, which stood on its banks.

is most observable, on this head, here, is the extraordinary lateness of harvest, in the neighbourhood of HIGHGATE,—only four miles from the metropolis.

In 1786, the harvest was forwarder, by several days, round Tamworth, in the midland counties, than at Highgate. And, in 1798, the harvest of Cheshire, still farther northward, took the lead of it; even that of Annandale, in the south of Scotland, was not, that year, much behind it. It is to be remarked, however, that in 1798, harvest in Scotland, and the north of England, was much earlier than usual; while, in the south of England, corn ripened in the ordinary season.

The extraordinary backwardness of the lands of Highgate may be fully accounted for, in the extreme coldness of the soil, and the extreme bleakness of the situation; the westerly winds pouring down the vale, for twenty miles, without a break; until they meet with those exposed heights.

WATERS. The THAMES is the river of the Vale: receiving, however, several brooks and rivulets, in its course through it. But, the Lea excepted, they are, separately, of inconsiderable size.

This forms a distinguishing character of the Thames. The Humber, which doubtless discharges more water, at its mouth (having a greater collecting surface) soon separates into distinct rivers, as the Trent, the Ouze, and its branches; which spread out in different directions: whereas the Thames preserves its entireness, for more than a hundred miles of its course; the Kennet being the first great branch, which lessens its magnitude.

SOILS. The riverformed lands, in the neighbourhood of London, and on the banks of the Thames, in various parts, are deep rich beds of mud; some of which are still liable to be overflowed.

The more extensive flat, mentioned above, as reaching from Westminster to the extremity of the Vale, on the Middlesex side of the river, consists chiefly of a gravelly loam, of a middle quality, and mostly lying on a bed of flinty gravel.

On the south side of the river, the flat, or area, of the Vale is formed of similar strata; but the top soil is generally of a weaker quality, owing to the substrata being less regularly absorbent; and has

frequently a slight covering of black moory mold; as if water had formerly lodged on its surface. This is particularly observable, on the Commons of Croydon, Mitcham, &c.

Nevertheless, there are portions of good land, interspersed, in different parts of the base of the Vale: although, on the whole, it may be considered as being, naturally, one of the least fertile vale districts, in the kingdom.

Even some of the hillocks and rising grounds, as those of Hampstead, Putney, &c. are of a barren nature. Others are of a strong, cold, woodland quality; as those to the northward of Highgate, part of Norwood, and the wide spreading common lands of the Epsom quarter: while, in other parts, but in small plots, the clay is of the stoutest, finest quality. A part of the metropolis is built on land of the last description.

The FOSSIL productions of this Vale are brick earth, and gravel; both of them (as has been intimated) being of a superior quality: materials of the first estimation in the environs of a great city.

The ROADS, round London, are proverbially good; in part, from the excellent

quality of the materials, found on almost every side of it, namely, a sharp flinty gravel, which binds well by reason of its asperities, and wears well, on account of its hardness;—and, in part, from the excellency of the form, in which roads are here made; and which ought to be followed, as a pattern, by the roadmakers of the kingdom at large.

One circumstance of the roads, in the more immediate environs of London, may be here noticed. To prevent *dust* from being troublesome, in the summer season, the roads are *watered*, with carts adapted to the purpose: and, in consequence, their surfaces become, in autumn, or a wet season, loaded with mud. This is brought as an evidence, that watering roads is highly prejudicial; as it *rots* them.

This popular opinion may be well founded, so far as the watering goes to soften the materials on the surface, and thereby to render them more liable to be worn away, and reduced to a state of mud. But I apprehend, that the far greater part of the apparent evil arises, from the reduced particles being detained, by the watering: while those

produced, on unwatered roads, are carried away, by the winds, in the state of dust. A strong wind, in dry weather, answers the same end, (without being liable to produce the same mischief) as heavy rains, in wet weather;—namely, that of freeing the surfaces of roads from *dirt*.

REMARK. This, alone, is a sufficient reason, for keeping down the hedges of lanes; especially, on the south and west sides; thereby letting in both sun and wind: not merely to dry up the wet, and free the road from mud, but *to carry off the dust, as it is formed.*

On the north and east sides, the wind, especially in summer, blows less frequently; and, in winter, high hedges, on these sides, are agreeable shelter to travellers. It ought to be considered, however, by those who have the ordering of road hedges, that, by keeping them down, on both sides, and thereby preventing the recoil of the wind, which high hedges, as high buildings, produce, the dust will be carried off, with increased effect; and with less inconveniency to travellers, as well as to beasts of draft, in the summer season.

INLAND NAVIGATION. The Vale is already well accommodated with WATER CARRIAGE. The Thames is navigable, throughout. And the Lea, the Brent, the Coln, and the Wey, are more or less navigable.

Nevertheless, it appears to me, in a strong and impressive light, that an IMPROVEMENT, of immense magnitude, remains to be effected, by an INCREASE of WATER CARRIAGE, through these Vale lands. A navigable canal, of suitable dimensions, leading through the extensive level, on the north side of the river, nearly in a straight line, between Westminster and Windsor, would not only shorten the distance, occasioned by the circuitous windings of the river, and avoid its floods and other impediments, but would cut off an incalculable expenditure of ANIMAL LABOR, now incurred, in conveying the various articles of farm produce, manure, and other heavy lading, as well as PASSENGERS, to and from the METROPOLIS.

The PASSAGE BOATS, established by the Duke of Bridgwater, on different branches of his canals, leading to and from Manchester, are not only a valuable accommodation

to the country, but are said to bring in an ample revenue.

What, then, may not be expected, whether in point of ACCOMMODATION, or PROFIT, independent of NATIONAL ADVANTAGE, from a similar establishment, attached to the capital,—and leading through the populous line of country, under view.

The beneficial influence of such a PUBLIC WORK would not be confined to the immediate banks of the canal, but would extend, for some miles on either side of it, and for many miles beyond its farther extremity. And the facility with which it might be formed, as well as the dispatch which vessels might make upon it, are evident in the natural flatness of the country.

STATE OF INCLOSURE. A considerable portion of the lands of this Vale, even within a few miles of London, remain in the same state of nature and neglect, as that in which they were found by the first inhabitants, and in which they lay, on the day of its foundation!

Beside the commons, mentioned, the lower skirts of Epping Forest, Enfield Chase, with Finchley, Hounslow, and other Commons,

are *still* suffered to remain, in a state that would be disgraceful to the most recluse part of the Island. For *still* a GENERAL INCLOSURE BILL remains unpassed!

For the principles on which such a bill ought to rest, and on which it may, *without difficulty*, be formed, see the RURAL ECONOMY of YORKSHIRE;—first published in 1788.

In the western parts of the Vale, much COMMON FIELD land remains uninclosed; and, in the south-eastern quarter, some remnants are left; with much COMMON MEADOW ground, I believe, in every part of it.

PRODUCTIONS. In a general view, the VALE OF LONDON is characterized by ARABLE CROPS: its gravelly and lighter lands being better adapted to corn, than to permanent herbage.

In the neighbourhood of London, especially on the north side of the town, where plots of strong cool land—some of them of superior quality—occur, GRASSLANDS abound,—in a state of mowing grounds and cow pastures,—to supply the markets with hay and milk. And even the gravelly and

weaker lands are, there, kept in a state of GRASS, by repeated manurings.

The WOODLANDS, at present, are few: notwithstanding some considerable portion of the lands of the Vale, heretofore, when wood was the fuel of the metropolis, must necessarily have been kept in the state of woodiness.

In the environs of the town, and for some miles distance to the westward of it, GARDEN GROUNDS occupy, at present, no inconsiderable portion of the lands.

APPEARANCE. Notwithstanding the singular flatness of the base of the Vale, the rising grounds, scattered over it, or forming its marginal banks, give variety of feature, to its surface, when seen in almost every point of view.

In the DETAIL, it is equally interesting. The Thames is strongly characterized, by the grandeur of its lengthened lines, and the gracefulness of its bends. Where rising grounds form its more immediate banks,—as at Greenwich, Richmond, Windsor, (well chosen princely sites) the scenery is frequently of the finest cast; combining every advantage of ground, water, wood, and

buildings, when disposed in endless variety, on the face of a cultivated country.

The POINTS OF VIEW, which this passage of country affords, are innumerable. Every hillock which rises in its area, and each swell of its margin, commands fine prospects. If those from Hampstead Heath could not be enjoyed without travelling some distance from town, they would be much admired, and doubtless would be celebrated for their grandeur and variety. From Windsor, the distant prospect is still more extensive and magnificent. Mr. BARKER, in the admirable Panorama Painting, which he is now exhibiting, has brought almost the entire vale, within one point of view.

AN

OUTLINE

OF ITS

RURAL ECONOMY.

ESTATES and their MANAGEMENT.

ON these subjects, I have little to register.

PROPERTY is much divided, among small owners. There are few large estates. Yet, those of two or three thousand pounds, a year, occur: even within a short distance from the capital.

The TENANCY has been, perhaps, for some length of time, LEASES, for a term of years; and, usually, I believe, for twenty-one years.

RENT. Reasoning from ordinary premises, and comparing the metropolis with other large towns of the kingdom, a com-

paratively high rent might, of course, be expected, in the Vale District under view. But this has not, of late years at least, been the case. Lands, of equal quality, have, during the last twenty years, been rented higher, in the Vale of Pickering, situated at more than two hundred miles from the common market of the kingdom, than in the Vale of London, which infolds the metropolis in its bosom.

The cause is evident. The practice of the Vale of London, until of late years, has been handed down, with few alterations, probably, for centuries past; while the northern provinces, during the last twenty years, have been alive to every improvement. The arable lands of the North of England are cultivated, at little more than half the expence, of those in the Southern Counties: not merely on account of a better plow, and a less expensive plow team, being there in use; but owing to the price of living (not of labor) being there cheaper; as well as to the habits of industry, and frugality, and the spirit of improvement, in every department, being there more prevalent.

The TIME of the REMOVAL of tenants, from farm to farm, is Michaelmas, or Ladyday.

FARM BUILDINGS are still chiefly of wood! Formerly, dwelling houses, at least, have been constructed with large timbers, framed together in squares, and filled in, with bricks, or with laths and plaster; of which construction the majority of the farm houses still remain. Now, dwelling houses, especially of the larger farms, are built with bricks. Barns, stables, and other offices have long been, and still are, invariably, of a slighter kind of framework, covered with boards, as in the DISTRICT OF MAIDSTONE, and other parts of the SOUTHERN COUNTIES.

It is observable, that, in this part of the Island, almost every farm, let it be ever so small, has a GRANARY, set on pillars, to guard against vermin; the inside being fitted up, with deep bins, to receive different kinds of grain; a building which may be said, to be unknown, to farmers, in the North of England.

In the CONSTRUCTION of farm buildings, and the PLANNING of farmyards, no district of the kingdom is more deficient, than the

environs of the capital! A dwelling house, a barn, a stable, a cow shed, and a pig stye, are generally seen scattered, as circumstances, or temporary conveniences, have pointed out. The Wilds of Kent and Sussex may vie, in this respect, with the Vale of London. I speak of the ordinary homesteads of professional men: not of those appendent to gentlemen's villas, or the country houses of citizens.

FENCES. Most of these vale lands,—excepting what have been cleared for common fields, or common meadows, and the common pastures which are yet unappropriated,—appear to have been inclosed, from the forest or woodland state: not from a state of stinted pasture grounds, or hams. See WEST OF ENGLAND. The hedges are not only crooked, but have many of them, here, as in the Wealds of Sussex and Kent, wide borders attached to them, even to this day. Not however, so much, as nurseries of timber—as of brush wood and weeds.

FAGGOT WOOD, until of very late years, has been an article of value; and hence the practice of encumbering farm lands with

HEDGE BORDERS, of LOPPING the side boughs of some trees, and cutting off the heads of others, at eight or ten feet high, and keeping them in the POLLARD form: the side boughs of trees, the heads of pollards, and the coppice wood of borders, being cut, every seven or eight years, or as often as it becomes of a proper size, or as the circumstances of the farm require, for fagots, stakes, edders, and the fillings of dead hedges.

At present, fagots are of decreasing value, in London: owing, I understand, to the bakers having found it cheaper, to heat their ovens, with coals, than with fagot wood, above a certain price: a circumstance, which may tend to clear away the pollards and hedge borders, which, at present, disgrace the country.

WOODLANDS.

THE AREA of the Vale, as has been intimated, contains little extent of woodland.

A remnant, however, of the extensive tracts, which doubtless occupied, formerly, some considerable portion of these vale lands, remains. The woods of Highgate, attached to the Bishoprick of London, cover some hundred acres of inclosed lands.

Tradition, on the spot, gives as a reason, for this remnant being left, that, at a distant period, when part of these woods were clearing away, the bakers of London petitioned to have them left, as a supply of fuel, which their business then required.

At present, however, the facility of inland carriage, both by land and water, has done away all cause of apprehension, for a want of baking fuel; even had not the use of coals been found out, as a substitute for wood. And, whether in a public or a private point of view, these woods should now be cleared away. The lands of a principal part of them, at least, would be of more than twice the value, in agriculture, of what they are, now, in a state of woodland.

It is an extraordinary fact, which falls within my own knowledge, that coppice wood, in a remote part of Wales, lets for more, by the acre, than the woods under

notice, situated, as they are, within four or five miles of London.

REMARK. The ancient regulations, which belong to these woods, and which remain in force to this day, are peculiar; and, at the time of their establishment, were doubtless founded in wisdom, and had resulted from long experience.

These woods are *now* divided into *nine falls;* one of which is cut down, every year; and, of course, at nine years' growth. But instead of clearing the ground, wholly, many of the stoutest of the oak saplings are suffered to remain, on the ground, until the next fall (a certain number in each rod, or perch of ground, is stipulated, I believe, but cannot be regularly adhered to); when they are, in course, of eighteen years' growth.

These oak saplings are set out, by an officer, or tenant, of the See, called the Patentee of the Woods, who holds his place for life; and who, at the ensuing fall, takes down the saplings so left; peels them; and takes as his perquisite, the bark and the top-wood arising from them; leaving the naked poles, for the tenant, or immediate occupier of the woods. Also, in each fall, or division,

a certain number (not a large one) of timber trees are kept up: the timber of which is claimed by the incumbent, for the time being, the bark and topwood by the patentee.

Thus, in pursuance of this simple regulation, a constant supply, not only of brush-wood, and fagots, but of billet wood, poles, timber, and bark is kept up. Whereas, without it, the supply of BILLET WOOD must necessarily be wanted. And it is highly probable; that, while billet wood remained the ordinary fuel of rooms, especially of the middle and higher classes, similar regulations subsisted, in all the woodlands of the country; and that the present age of felling,—namely seven to ten years, according to soils and situation,—are the ancient ones, handed down, with little or no alteration; except that of omitting to set out sapling oaks, for billet wood. And had there not been an interest, in the woods under notice, distinct from that of the possessor (the patent place being of course disposed of by the person in possession, at the time a life drops in) they might, in like manner, have slid, by degrees, under the modern course of management.

AGRICULTURE.

FARMS. The VALE OF LONDON lies, at present, in farms of various sizes. In general, however, they are below the middle size: two or three hundred acres of land, of a middle quality, being esteemed a large farm, I believe, in any part of the Vale: unless near the metropolis, where there are three or more cow farms, that are let at high rents.

On the whole, there is that sort of gradation in size, which is every where to be desired; at least, in arable districts. And the only remark, perhaps, that is required to be made on them, here, is that, had there been more large farms, as from two to three or four hundred acres, the state of husbandry would probably have been farther advanced, and more on a par, with the best cultivated districts, than it is found, at present.

FARMERS. It may afford matter of surprise, to those who have not approached the capital, and conversed with the country

people, in its neighbourhood, that the farmers of the Vale of London, even within a few miles of the town, are (the higher class excepted) as homely, in their dress and manners, as those of the more recluse parts of the kingdom, and are far less enlightened and intelligent, than those of many parts of it. The reason is, they live chiefly among themselves, as a distinct community: retaining much of the character, probably, of husbandmen of former times; and holding their prejudices, as fast, or, at this time perhaps faster, than those of the most distant provinces.

There is an excuse, however, for their tenacity to established customs and practices, though not the most eligible. They are accustomed to see ill judged plans pursued, and money wastefully expended, by the town farmers, who purchase or rent lands in their neighbourhood; and, hence, naturally enough conceive, that any deviation from the beaten path will necessarily lead them to ruin, or involve them in a miscarriage.

The WORK PEOPLE of the Vale wear the same marks of rusticity, as their em-

ployers. The children of farm laborers, and other poor working people, in the neighbourhood of London, rank among the most illiterate of their class, in the Island. Few of them (unless of late years, through the establishment of Sunday schools) are taught, even to read. A want of free schools, in this part of the Island, is a probable cause of the low state of ignorance, in which this class are found, in the southern provinces, comparatively with the same class, in the northern.

It is to be observed, however, that a considerable portion of the work people, particularly men, employed in the District, are not natives of the country; but are collected from all parts of the kingdom. Having been compelled, by crimes, or follies, to leave their own countries, they press towards the center of depravity; or perhaps enter it, and are afterwards vomited from its infectious maw, and thrown, as a grievous pest, upon the surrounding country; or, at best, as a necessary evil, to supply the place of the industrious and deserving natives, who find work and better wages, in the warehouses and workshops of trade and

manufacture, in town, than husbandry can afford them.

To assist in the harvests, both of hay and corn, many Irish and Welch, and some North-country-men, resort to this quarter of England; spreading, more or less, over all the southern provinces.

BEASTS OF DRAFT. These may be said to be wholly horses; but of various breeds. Some midland-bred horses of the first quality are seen; but more mongrels, and offcast coach horses. Few markets in the kingdom exhibit so mean a collection of horses, as the hay and straw markets of London.

The ROAD TEAM is four horses, at length, in a waggon, or three, likewise at length, in a cart. The PLOW TEAM, too, is four, at length; except in barley seedtime, or in stirring light fallows, when three are more generally employed.

Four horses are the emphatical *team* of the country; and are considered as affording full employment, for a man and a boy.

IMPLEMENTS. There is little to be noticed, under this head. The implements of this part of the Island are of the plainest

kinds. There is nothing of excellence, or even of peculiarity, observable, except in the HAY CART; which, having been long and much in use, has received a form that is well adapted to its purpose. The body is that of a common dung cart; to which is added a "copse," or covering of the shaft horse; a sort of open floor, projecting from the top of the fore part of the cart, and supported by long pins, reaching down to the shafts: thus inclosing the horse, except his head and neck, in a sort of cage. By this contrivance, a great length of carriage is given; so as to be able to lay on (with the additional help of a long tail ladder of the ordinary form, and two small side ladders, to guard the load against the dirt and friction of the wheels) a ton of hay, in trusses, with great safety, and with ease to the shaft horse; the load being, by these means, low and well balanced.

The WAGGON has nothing peculiar, either in its size, or construction. It resembles that of the DISTRICT OF MAIDSTONE, described in the SOUTHERN COUNTIES.

The PLOW is described, in the following MINUTES.

OBJECTS OF HUSBANDRY. The MARKETABLE PRODUCE, chiefly aimed at, by the farmers of the Vale, are CORN and PULSE of the several kinds; HAY, STRAW, and FAGOTS; VEAL, and DAIRY PRODUCE, BARREN COWS, HOUSE LAMB, GRASS LAMB, a few FAT SHEEP, SWINE, and POULTRY.

The COURSE OF PRACTICE, unless in an important particular, may be said to be, altogether, without regularity.* What marks the practice of this part of the kingdom is, that the same lands, though in a state of inclosure, and equally adapted to grain and herbage, have been continued, perhaps, for ages, either under a course of arable management, or in a state of perennial herbage; and have not been changed from grass to corn, and grain to herbage, conformably with the practice of most other early inclosed districts. See MIDLAND COUNTIES, WEST of ENGLAND, &c.

REMARK. Improper, however, as this plan of management would be, in ordinary situations, where the land has nothing but its

* See remarks on this circumstance, in the DISTRICT OF MAIDSTONE.

own produce to depend on, for its support, it would be, under due limitation, perfectly right in the neighbourhood of the metropolis, or of other large towns, where the herbage of old grasslands, whether for hay or pasturage, is required, and where a supply of manure can be had, to keep up the arable lands in sufficient condition, without permitting them to renew their strength, occasionally, in a state of herbage.

Nevertheless, eligible as this practice may be, on strong lands, which will lie long and well in grass, and, when plowed up, are not readily brought back, to a state of profitable herbage, it can seldom be so, even in the Vale of London, on lighter lands; which, without incessant manurings, will not continue to throw out profitable crops of hay or pasturage; and which, in most cases, ought, indisputably, to be subjected to an alternacy of grain and herbage.

In the management of arable lands, the summer fallow is still in use; and invariably, I believe, for wheat, on the stronger lands. I have observed no instance, unless in my own practice, of fallowing such lands, for spring corn, and ley herbage. On

lighter lands, however, the turnep fallow is used, in this intention. Tares are an ordinary crop, for green forage for cart horses, and to be succeeded by wheat, or by turneps, and afterwards, by barley, the ensuing spring.

TILLAGE. The same blame attaches to the husbandmen of the Vale of London, as to those of the other districts of the southern department, for using four horses and a driver, in plowing lands, which two horses, or two oxen, guided and driven, with reins, would work in an equal manner, and at half the expence; as will be seen in the following MINUTES.

MANURES. The principal, or sole, dependence, within ten miles of London, is on TOWN MANURES; namely, stable dung, night soil, and animal substances,—the offal, refuse, and sweepings of slaughter houses, and manufactures of various kinds.

Formerly (not half a century ago) inns, and livery stables, paid the farmers, who brought them in hay and straw, for taking away their dung, or hired carts to carry it away, to the outskirts of the town; where large mounds of it remained, but a few years since. Twenty years ago, the price, in the

stable yards, was only a shilling to eighteen pence, a load: and, even at this time, I understand, no more than two shillings or half a crown is given, for a full cart load of horse dung, produced from hay and corn of the first quality;—equal in value to three or four loads of farmyard manure, made from straw, by lean cattle.

SEMINATION. The only deviation, from the ordinary method of sowing, (peas sometimes excepted) and which is here entitled to notice, is that struck out, by Mr. DUCKET, formerly of Ham, near Richmond, and since of Esher, on the southern skirts of the Vale,—a professional and superior husbandman, from the Isle of Wight; who, by an implement, on the principle of the drag plow of Hampshire, and the stricking plow of Kent (see the SOUTHERN COUNTIES) grew his corn, in rows, or drills, with narrow intervals; which, by the means of a range of hoes, corresponding with the seed plow, and drawn by a man, walking backward, he hoed, while his crops were growing: and this, not on a small scale, but as an established practice, throughout his farm: a practice which, I believe, he

still follows. I do not understand, however, that it has ever spread wide, among professional men.*

GROWING CROPS. When they are incorrigibly foul, with seed weeds, especially the wild mustard, as they not unfrequently are, in a "ketlock year," so as to set hand weeding at defiance, the *tops* are frequently struck off, with a sithe, *to reduce the yellowness*, and give a degree of head-room to the crop; but leaving, beneath, seed pods enow, to supply the land with plants, for years to follow.

In the ordinary practice of the country, the hoe is seldom used; except for turneps; or for peas, raised in rows, with wide intervals, in the gardener's manner.

HARVESTING. Wheat is cut, with sickles, and set up in uncovered shucks: barley and oats, with the sithe, and left in swath, until the time of carrying; when they are cocked, and carried loose. Peas are either cut with the sithe, or with the *swap*, described in the DISTRICT of MAID-

* For a trial of this implement, see NORFOLK; MINUTE 19.

STONE. And for the method of loading, &c. see that District of the SOUTHERN COUNTIES.

FARMYARD MANAGEMENT. STRAW, (that of wheat excepted) is, almost invariably, consumed, in open yards; generally thrown into heavy, square "cribs," scattered about the area of the yard; with seldom any shed, or shelter, for the stock.

WHEAT STRAW is bound up, with great neatness, in trusses, of thirtysix pounds each; thirtysix such trusses being the London load: a cart carrying a load and a half, and a waggon two loads, to market.

MARKETS FOR CORN. Conveniently as the metropolis may seem to be situated, to draw together the produce of the Vale, immediately from the barns or granaries of the growers, and useless as any other market, for many miles round it, might be conceived, the Vale of London abounds with MARKET TOWNS: some of which are well attended, and much business transacted in them, weekly; especially in corn. I can speak more particularly of CROYDON, in the south-east quarter, and UXBRIDGE, in the west.

It is observable, that, at the market of

Croydon, corn is sold, *by sample*, to millers and maltsters of the neighbourhood, or to dealers who purchase for the London market. On the contrary, at Uxbridge, corn is brought, *in bulk*, to market, and "*pitched*" in sacks, under the market house, or in the open street; and, if not sold, is stored up for another market day: agreeably to the practice of Berkshire, Wiltshire, Hampshire, &c.

REMARK. This mode of disposal is inconvenient to the farmer; as frequently incurring a serious waste of carriage and attendance; and this without any counter advantage, to the purchaser or the consumer. The most plausible argument in its favor is, that it may sometimes save disputes, on the delivery, about measure, weight, or cleanness, comparatively with the sample, when this is used as the mean of disposal. But, where selling by sample is the established custom, disputes of that kind seldom happen; and are nearly as liable to arise from sacks, as from samples. Farmers find, by long experience, that, in this, as in other things, honesty is the best policy. The character of a man, who deals unfairly, is

soon known, to the buyers in his neighbourhood; and he must, of course, afterwards deal with disadvantage. The popular idea, that selling by sample favors monopoly, is futile; as a farmer cannot, strictly speaking, be said to monopolize his own produce. He has an undoubted right to bring it to market, when, and in what manner, he pleases.

GRASSLANDS. The two main objects of the grassland management, within ten miles of town, are *hay* for the *London markets*, and *pasturage* for *cows*. Much meadow hay, however, is likewise used, in the country; and some pasturage is applied to sheep; also a small proportion to horses.

At a distance from town, a CHANGE of these two objects is usually made, when circumstances will suit: it being known, to men of discernment, that, by mowing the same ground, every year, the produce (unless meliorated by frequent manurings) "runs to bents," and that pasturing furnishes it, with "fine herbage."

But nearer town, as in the grassland townships of Marybone, Pancrass, Isling-

ton, Highgate, Hampstead, Hendon, this change seldom takes place; town manure being depended on, for keeping the lands in a state of luxuriance. The *hay farms* (on which little stock is kept, except sheep in the winter months) are constantly mown, every year, and in many instances, twice a year; and the *cow grounds* (still more highly enriched) are generally, I believe, both pastured and mown (perhaps more than once); a very few weeks being time enough, to throw up, and mature sufficiently for cows, an ample crop of hay.

In the MANAGEMENT of grasslands, there are but few points which require to be noticed. They are strongly manured. The mere hay grounds are dunged, every second or third year. On a considerable estate, in the grassland quarter, mentioned above, the tenants covenant to take only one crop, yearly; and to manure, every third year, agreeably to the custom of the country; which is that of laying on a thick coat of town manure.

The *time of manuring*, observed by judicious managers, is summer; immediately after the hay crop is carried off; a practice

which ought to be invariably pursued, on the strong lands, now more particularly under notice. See the following EXPERIMENTS, on this particular.

The *time of shutting up hay grounds* is early in the spring: the first shoot being seldom suffered to be cropped, by stock.

As the season advances, and the surface becomes sufficiently dry, these grounds are usually *bush-harrowed*,* and generally *rolled:* so that their surfaces, are kept smooth, and in good order, for mowing and making their produce.

In the strongly soiled cow grounds, near town, where the *aira cæspitosa* is liable to form tufts, or "hassocks," in the lower more swampy parts, I have seen them cut up, beneath the roots, with spades, and carted off the ground: an operation, which might be profitably applied, in many other situations. For bottoming dung yards, these tussocks might be found valuable; and their removal, if the dimples, left by it, were filled up with fresh mold (with or without grass seeds scattered over it) would, in many cases, pay doubly for the labor.

* See MINUTE 51, on the Bush Harrow.

The HAY HARVEST, round London, is conducted in a superior manner. Whenever an operation, or process, in husbandry, becomes intimately connected with the leading object of a country, and continues such, through a series of generations, we generally, though not always, find it, there, arrived at a degree of excellence.

The *Mowing*, being chiefly done by itinerants, is not the best part of the process. But the *Making*, being more under the controul, and management of the farmer himself, is generally well performed; better, at least, than in most other districts of the Island.

A man, who knows, that the price of hay, and the readiness of its sale in the London markets, depend on its quality, accurately judged,—by stable keepers, and others, who have an interest in purchasing such, only, as they know will be eaten up clean, without any part of it being pulled through the rack and blown upon,—finds his own interest, in having the herbage well broken, and intimately mixed, so that no bundles of stale bents, unblended with the finer herbage, shall pass through his hands,

and find their way to market; as well as in preserving, as much as may be, its flavor and color.

To this end, experienced hay farmers break their green herbage, carefully, out of swath; suffering no stale or coarse tuft to remain entire. To assimilate it the more completely, and render it of an even quality, as well as to preserve its flavor and color, it is timely gathered into small cocks, or bundles, of a size proportioned to its degree of dryness, and is not suffered to lie too long, abroad, spread over the whole ground; especially if the weather be fickle. In the morning, or to catch a fair blast, it is respread, turned and mixed, again and again, until it be sufficiently dry; without regarding any reasonable expence bestowed, on putting it in a state of safety, and exposing it to the atmosphere, alternately; well knowing that its superior value, at market, will amply repay the cost.

Nevertheless, it must not be omitted to be mentioned, here, that there are men, knowing this, who suffer their hay to be spoiled on the ground, for want of due attention. But there are slovenly improvi-

dent managers, in every situation, and in every deparment of business.

A want of *hands* can seldom be pleaded, as the cause of hay being badly manufactured, in the neighbourhood of London: this being their place of meeting,—from Ireland, from Wales, and different parts of England;; and their first place of employment, for the summer; from whence they diverge, in different directions:—those, from the North of England, working their way, home again, by stages; as climature leads them.

On the *stacking* of hay, in this District, little requires to be said; except that the same principle of breaking the lumps, and mixing the materials, is observed, on the stack, as in the field.

The *form of the stack*, in this Vale, is usually the long square: a form which is most convenient, where hay is cut out, in square trusses, for market.

The *sizes of hay stacks*, at a distance from London, may be set down at fifteen to thirty or forty loads. But, in its immediate environs, in the cow keepers' yards, stacks of an hundred loads, or upwards, are

not uncommon: moveable stages being, by some, erected, for the greater conveniency of raising the hay, to the upper parts of the stacks. I have seen twenty people employed, in making one of these enormous piles; which are not only expensive, but hazardous; they being more liable to be caught in a rainy season, and to be heated, or fired, if the hay is not put together, thoroughly dry, than stacks of a moderate size. A want of yard room may serve to apologize for the practice: and a large stack is less liable to suffer, from March winds, than a small one.*

To prevent hay stacks from over heating, it is common to draw up a sack, or sacks, filled with hay or straw, as the stack is carried up, and thereby to form a flue, or chimnies, to carry off the steam, and with it the superfluous heat; as it is generated: or with the same intent, a tall wooden trunk, or large square pipe, formed with four boards, eight or ten feet long, and a foot or more in width, is erected upon, or rooted in, the basement, or platform, of the stack;

* See MINUTE 268, on this particular.

and, as the hay reaches its top, it is drawn up, from time to time; thus, not only leaving a narrow flue below it, but letting out the steam with freedom, even while the stack is forming: the trunk being perforated, on every side, with many holes, to admit the steam.

DISPOSAL OF HAY. Hay, intended for the London markets, and universally, I believe, throughout the Vale under view, is bound, in trusses of fiftysix pounds, or half a hundredweight, each: thirtysix such trusses, *of seasoned hay*,—that is to say, of hay that has passed the state of fermentation, and has had sufficient time to cool in the stack,—being the load, or nominal ton, of this part of the kingdom.*

The *binding* of hay is, here, a sort of distinct business; and is frequently carried on, as such, by thatchers; to whom it affords

* In other parts of the kingdom, it is not unusual, at this time, to sell hay in the field, out of cocks, or winrows,—*uncured:* a custom which may, formerly, have been prevalent, in the environs of the metropolis; and the abatement of two hundredweights, in each ton, may have been fixed upon, as an equivalent, for the loss of weight in curing.

seasonable employment, during the winter and spring months. It is universally bound, in long-square trusses; namely, three feet or upwards, in length, and 2½ feet or more in width; its depth, or thickness, being in proportion to the closeness of the hay, given by the size of the stack, and the degree of heat it has undergone. These trusses are bound, with two strong twisted bands, of straw or coarse hay; and are weighed with steelyards,—either suspended under a ladder, leaning against the stack,—or hung upon a hay fork, whose tines are stuck firmly into the stack, the other end resting on the shoulder of the workman; who first kneels, or stoops down, to hook the two long hooks of the steelyards to the two bands of the truss, and then, by rising erect, lifts the truss free from the ground; while he has both hands at liberty to weigh it.

The *price of binding* is eighteen pence, or more, a load.

The LONDON HAY MARKETS are four in number: namely, "Saint James's," for the west end of the town, held in the street bearing the name of the Hay-market;

"White Chapel," for the east end, held in the street of that name; "Smithfield," for the city; and "the Borough Market," held at the end of Blackman-street, for that quarter of the town.

It is chiefly (though not necessarily) sold by salesmen, who attend these markets; and at so much the short ton, or load, of 18 cwt. which is the usual load for a cart and three horses; a waggon and team of four horses as usually taking a "load and a half" to market.

HORSES. There are few good horses, I believe, bred, in any part of the Vale. On the commons, in its area, and on the chase and forest lands, which hang on its margin, some considerable number, of a mongrel, mean quality, are reared. Even within a few miles of London, groups of ragged wild ponies are seen, as on the mountains of Wales and Scotland!

CATTLE. The DESCRIPTION of cattle, kept in the Vale of London, is chiefly Cows; —for *milk*,—for *fatting calves*,—and for *butter*.

The BREED varies with the intention. the cow keepers, in the environs of London,

keep, almost solely, the shorthorned or Yorkshire breed; the suckling and butter farmers, almost as invariably, the long-horned, or "Staffordshire" breed; while, in the grounds and paddocks of gentlmen, the Welch, the Suffolk, and the Alderney are the most frequently seen.

The LONDON COW KEEPERS are supplied with heifers, pregnant with their first, or a few with their second, calves. These are bought up, in Yorkshire, and Durham, and some, I believe, in Lincolnshire, by dealers; who drive them southward, into Northamptonshire, or Bedfordshire; where they are met by other dealers, who supply the cow keepers, or by the cow keepers, themselves.

Their motives for choosing this breed of cows, in preference to every other, are two. They preserve a fulness of flesh, even when in full milk; and may, when their milk fails them, or accidents overtake them, be disposed of, the next market day, in Smithfield, with advantages that a leaner kind would not afford. And another reason for their choice, is, that they give a larger *quantity of milk*, than cows of the long

horned breed; though the *quality* may be inferior.

But what is observable, the bulls, employed by these cow keepers, are uniformly of the longhorned kind: and the reasons given for this practice are, that the cows are found to calve, with less difficulty and danger, than when bulls of the shorthorned breed are used;* and another, that the suckling farmers like the calves the better, for having some "Staffordshire" blood in them: and this may not be altogether the effect of prejudice; as some advantage may arise from a *first cross*.†

The BUSINESS OF COWKEEPING, on the skirts of a town, and solely to supply it with the particular article of milk, cannot well be considered as a legitimate branch of farming. Beside, it is partial, and limited in its extent; and is only allied to the management of farm stock, as gardening is to agriculture. An outline, therefore, is all that can be required, in this place.

* See YORKSHIRE, on this subject.

† See MIDLAND COUNTIES; also Isle of Wight, in the SOUTHERN COUNTIES; Articles BREED OF CATTLE.

The *foods* of these cows are grass, hay, grains; and, of late years, turneps, cabbages, and tares. With these (except the first, and, in some instances, at least, the last).

They are *fed, in the house*, tied up, two and two, in stalls; and are let out into large yards, or lobbies, in winter, for water, air, and a degree of exercise; or into their pasture grounds, in the summer season.

The *times of milking* are, nominally at least, four o'clock in the morning, and at noon: these times being best suited to the hours of delivery, or distribution of the milk.

The *milkers* are, principally, or wholly, those who retail the milk, in the streets; and who, of course, bring it with them to town, *fresh* and *new*, from the cows.*

The *age of throwing up* these milk cows depends on their merit, as such. If they turn out good milkers, and take the bull, in due season, they are kept on, to a full age.

* As to whether it is *watered*, in the cow house, or *creamed* in the milk cellar, I have no authentic information.

The *disposal* of them, I believe, is invariably to the butcher: and, in the ordinary practice of cow keepers, without any other preparation, I understand, than that of drying them, and continuing to feed them, as cows in full milk. In one instance, however, to which I had an opportunity of paying some attention, the offcast cows were fatted, with forcing foods, to a great value.

The *number* kept, by individuals, is extraordinarily great. Some years ago, I was informed, that one keeper, at Mary-bone, had near a thousand head of cows! And at present, I understand, there are three or four men, who have upward of five hundred, each.

The SUCKLING FARMERS work on a much smaller scale: ten or twelve cows being considered as a well sized stock,—fifteen to twenty, a large one,—within the area of the Vale lands, now under view.

These cows are mostly *purchased*; few being bred in the country. They are brought into it, in a manner similar to that by which the London cow keepers are supplied. They are picked up, by dealers, in the Midland Counties, and driven, by a

route which has not yet occurred to my observations, into this country, under the name of "Staffordshire heifers."

The *general economy*, or plan of management, of suckling or dairy farmers, varies: some fat calves, the year round; never suffering a pail to be set under a cow; others suckle, or make butter, as a supply of calves, the expectant price of veal, or a demand for butter, or other circumstance, points out.

The *alien calves* are procured, generally at three or four days old, from gentlemen, and others, who keep a few cows, for butter only; or in Smithfield, where they are bought for sale by the cow keepers.

In the *business of suckling*, there is little that differs from the ordinary method of fatting calves, at the teat, as practised in other parts of the kingdom: except that, in a constant suckling house, the calves are suckled, promiscuously, on the cows; not particularly, on their respective dams, even though they happen to be in the house; unless while the home-dropt calves are young.

To subject the cows to this unnatural

practice, they are fastened up, in a sort of pillory, to prevent their seeing or scenting the calves, while they are sucking; a precaution which is essentially necessary, in a common suckling house; as it would, otherwise, be difficult to reconcile the cows to the different calves, that are necessarily suckled upon them, in the course of the year.

The suckler (a man or stout boy) attends; and shifts the calves, from cow to cow, until the former have had their fill, and the latter are drawn dry. If the cows, collectively, have more milk, than the stock of calves require, (which ought ever to be the case) the surplus is drawn, by hand; for butter, or other purpose. But this, as has been said, is, in some cases, dispensed with; though, I apprehend, without good reason.

The *calves* are kept in *pens*, near, or within, the suckling house;* and either have lumps of chalk, hung up in cords, or pounded chalk, placed in troughs, to lick and eat, at pleasure. This is given them,

* For Remarks on CALF STALLS, and on CALF STAGES, see GLOCESTERSHIRE.

with the popular view of whitening their flesh; which it probably assists in doing; and, at the same time, it doubtless corrects the acidity of the milk; and thereby tends to prevent the flux, to which alien calves, in particular, are liable; owing, chiefly, I believe, to the circumstance of young calves being suckled, on cows that are old in milk; a circumstance, which judicious sucklers endeavor, as much as possible, to guard against.*

The *age of selling* calves, fatted in this manner, and in the neighbourhood of London, is eight, ten, or twelve weeks; sometimes, even a greater age.

Some remarks on suckling calves will appear in the following MINUTES.

SHEEP. The objects of sheep farming, in the Vale, are ewes and lambs; but, principally HOUSE LAMBS: an article of luxury; and a species of farm produce, for which the demand is partial; as being merely incident to great towns: indeed, until of late years, they were peculiar to London.

* For Remarks on this subject, see GLOCESTERSHIRE, article REARING CATTLE.

And even in its neighbourhood, at the present day, they are far from being a common article of farm stock; unless in particular spots. The principal supply of the markets may be said to be furnished, by a comparatively few individuals; whose soils and situations happen to suit; and who have been led, by other circumstances, into this peculiar line of business.

The GENERAL ECONOMY, of the house-lamb breed of sheep, has been given, under the DISTRICT OF PETWORTH, in the SOUTHERN COUNTIES.

In the BUSINESS OF SUCKLING LAMBS, I have had no practice: and my observations have, hitherto, been incidental: for although, I have, repeatedly, had opportunities of seeing the practice, and have paid more or less attention to it, at different times, I never studied it, sufficiently, to register it, here, in detail. Nor is this requisite. A general idea of the practice, and the reason on which it rests, will, I trust, be deemed sufficient.

The intention of fattening lambs, in the house, is similar to that of fattening calves, in the same situation; namely, that of pro-

ducing animal food, of peculiar fairness and delicacy, comparatively with that of the same animals, when fattened, in the field; as, in that situation, it is produced from *milk alone*; in this, from milk and herbage, jointly: in that, the fibres become relaxed and softened, through a want of exercise; in this, they are strung to a more natural pitch, by that degree of exercise, which cultivated nature permits.

What principally distinguishes the two practices is, that alien lambs are not to be purchased, as alien calves are; evidently owing to the circumstance of cattle, alone, being here kept, as animals of milk, for domestic purposes.

Hence, in the practice now under notice, the lambs are permitted to enjoy, respectively, the natural nourishment provided for them, by their own dams; and this, only; so long as it is sufficient to maintain them, in that luxuriant state, which the practice requires. But, especially in cases of twin lambs (to which the house lamb breed of sheep are very liable) it is seldom, I believe, if ever, sufficient, to finish them for market. It therefore becomes necessary, to preserve

the ewes in milk, after their own lambs are disposed of, to make up the deficiency.

The suckling house, for lambs, is a roomy building, with pens or hutches, at either end, or in recesses, of a size proportioned to the number of lambs; so as to restrain their natural propensity to playfulness, and, in this ease, inordinate exercise, while the ewes are absent. In the area, or principal space, the ewes are shut up, occasionally, and the lambs let loose among them: they being permitted, in winter, at least, to remain together, during the night; and always to renew their intercourse, at one or more stated times, during the day.

Such lambs as remain unsatisfied, with the milk of their respective dams, are suckled on the nurse ewes: an operation which is somewhat tedious, and requires the same unnatural and compulsatory means, that are employed in suckling alien calves. The ewes are either held between the knees of the suckler, or are fastened, by the head, in forked stakes; which answer the purpose of the pillories for cows, mentioned aforegoing: this most irksome part of lamb-suckling being continued, until the

whole of the lambs are satisfied, or the entire milk of all the ewes is expended.

The foods of suckling ewes are grass and cultivated herbage, green rye and tares, turneps, cabbages, every thing, which experience points out, to be conducive to a plenty and richness of milk.

For a principal part of the art of suckling, whether lambs or calves, appears to lie, in supplying them, constantly, with a sufficiency of nutritious milk; so that they flag not, nor receive any check, from the day they are dropped, to the time of their disposal. Other points of good management are, to keep them perfectly clean, and in a temperature and pureness of air, best calculated to promote their health; and in the state of tranquillity, most conducive to the ends of luxury, for which this unnatural practice is pursued.

On the whole, however, there appears to be no serious objection to the practice; except that of the unnecessary expense of attention, and labor, which it incurs.

Of the SWINE of this country, or of their MANAGEMENT, nothing is required to be said, here. The BREED is chiefly a

variety of the Berkshire; with the Oriental kinds, and mongrels of every description. Remarks on them will appear, in the following MINUTES.

POULTRY, of every description, are kept. But none of them are of superior, or distinguishable quality, except the Dorking breed of fowls: and these have been already noticed, in speaking of the EASTERN CHALK HILLS of the SOUTHERN COUNTIES.

Of BEES the number, here, as in most parts of the kingdom, are shamefully few; and evidently on the decline. And, if the present prices of the sweets of commerce will not rouse Englishmen to a sense of their interest, in this respect, little hope will remain of the culture of these industrious collectors of native sweets being revived.

A

DESCRIPTION

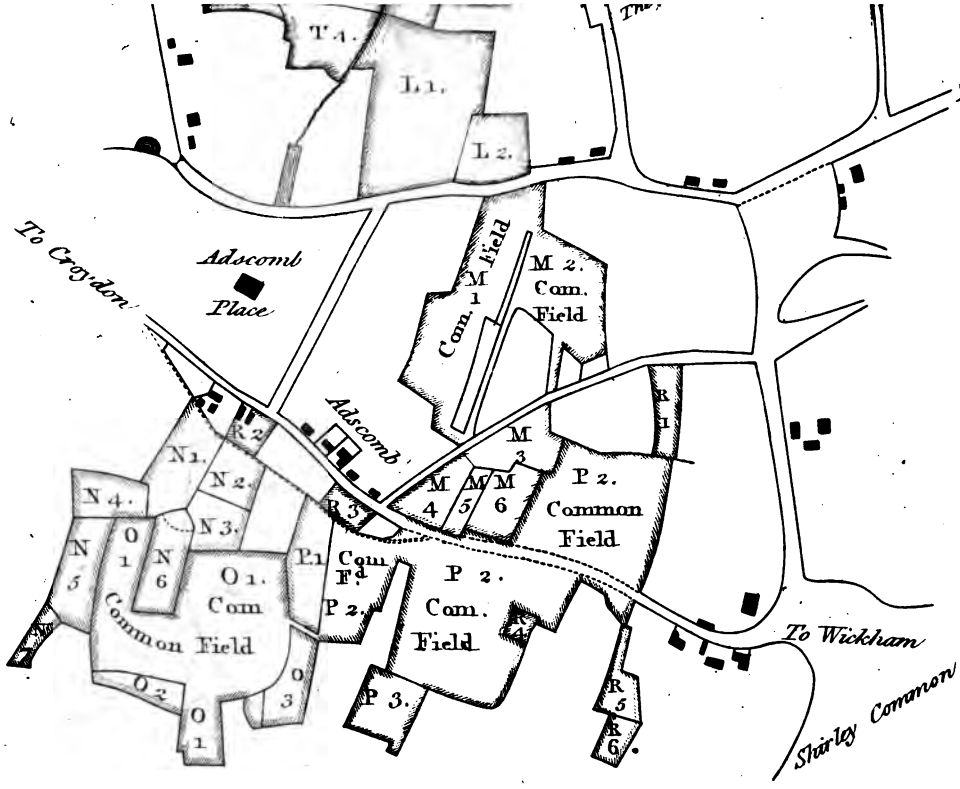
OF

THE FARM.

THE SITUATION of the lands, which gave rise to the following Remarks, is in the south-east quarter of the VALE OF LONDON, above delineated; lying between the hills of Norwood, and the chalky heights of Sanderstead: within the township of CROYDON; and between ten and twelve miles, due south from the METROPOLIS.

Their ELEVATION is varied. The more central parts are low; lying on the flat or base of the Vale. The most northern are raised, by the shelving skirts of the Norwood hills,—the southern, by a rising ground, which forms a part of the broken margin of the Vale, in this quarter.

The ASPECT, and degree of inclination,



MAP of the FARM

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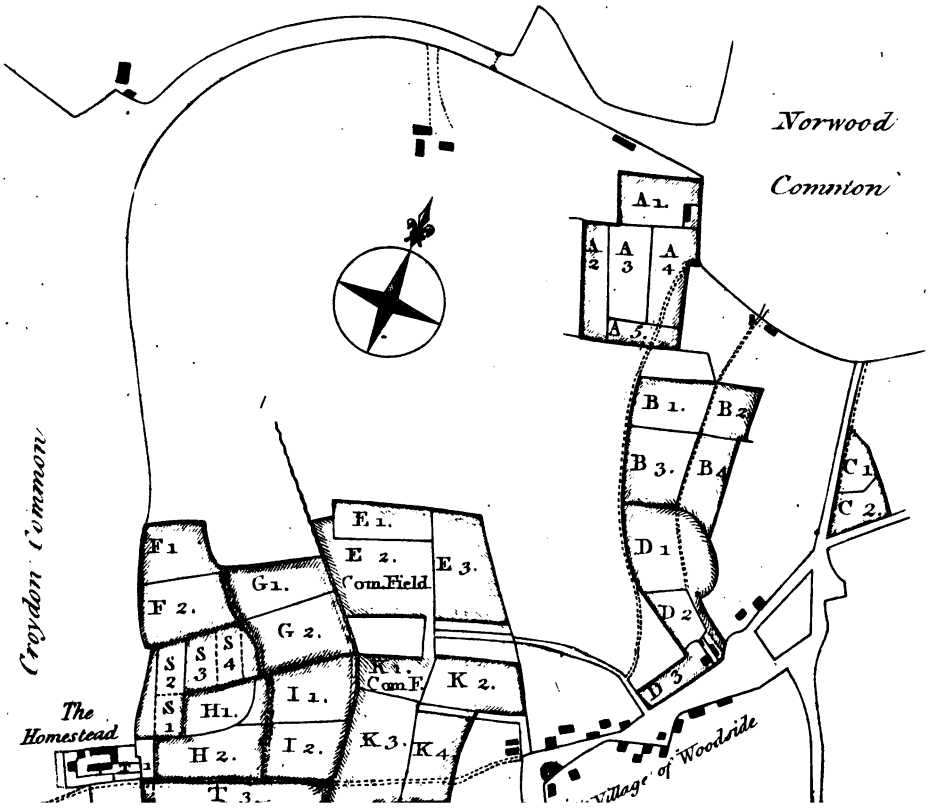
to be put in with a Guard, between P. 58 & 59 Vol. I.


Norwood
Common
Croydon Common
A 1.
A 2
A 3
A 4
A 5
B 1.
B 2
B 3.
B 4
C 1
C 2.
D 1
D 2
D 3
E 1.
E 2.
Com. Field
E 3.
F 1
F 2.
G 1.
G 2.
S 2
S 3
S 4
S 1
H 1.
H 2.
I 1.
I 2.
K 1.
Com. F.
K 2.
K 3.
K 4
The
Homestead
Village of Woodside

are of course various; and will appear in the following DESCRIPTION OF THE FIELDS.

The CLIMATURE is forward, even for the latitude (51° 20′). Harvest usually begins, from a week to a fortnight, earlier, in this situation, than on the adjacent heights of Kent and Surrey; situated, only at a few miles distance.

In respect to WATER, the central parts are well supplied, by a rill which runs through them: but the higher lands are more deficient, in water, for stock.

The LANDS are extremely various. The north end is strong, tenacious, and retentive; but various in fertility. The south is a gravelly loam, likewise varying, in depth and productiveness. The north-west quarter is a sandy loam, of various degrees of lightness; and is covered, in some parts, with black spungy earth; apparently formed by water, and aquatic plants, while it lay in a state of nature; before the country was cleared and drained; the substratum, of this quarter, being a deep bed of sand and gravel, deposited on a flat, and liable to be surcharged, in a wet season; as will appear in the following details.

With respect to PLAN, these farm lands were situated, the most irregular and inconvenient. They had, formerly, lain in three or four distinct farms, with farm houses and offices belonging to each; three of which still remained entire: beside a detached plot, with a barn, only. The several parts lay, more or less, disjointed, by intervening property, and the different farms intermixed with other lands; parts of them being in a state of common field, parcelled out in plots of the smallest size: with the right of pasturage on two adjoining commons.

Had I foreseen the difficulty and extent of the plan, which I have since been led to execute, I could not have fixed on a fitter subject of probation; a subject better calculated, to show the necessary variations of practice, and habituate me to the requisite versatility of management,—or to call forth exertion and expedients, and inure me to the more difficult and patient employments of husbandry,—than the assemblage of soils and situations, to which I was directed, by a train of fortuitous circumstances.

DESCRIPTION OF THE FIELDS.

Names.	Size.	Soil.	Subsoil.	Aspect, &c.
A. 1.	5 Acres*	Clayey Loam	Retentive†	Very gently Eastern.
2.	3 ——	Tenacious Clayey Loam ‡	—— ——	Gently Southern.
3.	3½ ——	—— —— —— ——	—— ——	Bold to the South.
4.	4 ——	—— —— —— ——	—— ——	—— ——
5.	1½ ——	—— —— —— ——	—— ——	Eastern; but nearly level.
B. 1.	3¾ ——	—— —— —— ——	—— ——	—— ——
2.	2¾ ——	—— —— —— ——	—— ——	Gently Northern.
3.	4½ ——	—— —— —— ——	—— ——	—— ——
4.	4¼ ——	—— —— —— ——	—— ——	—— ——
C. 1.	2½ ——	—— —— —— ——	—— ——	—— ——
2.	3 ——	Clayey Loam	—— ——	Northern; but nearly level.
D. 1.	7¾ ——	—— —— —— ——	—— ——	Various; principally Western.
2.	2 ——	—— —— —— ——	—— ——	Gently Northern.
3.	1⅞ ——	—— —— —— ——	—— ——	Level.
E. 1.	2⅞ ——	Adhesive Clayey Loam	—— ——	Very gently Western.

* The fractional Perches are omitted, as well for conciseness as perspicuity.

† Every subsoil is considered as *retentive*, which retains or checks the superfluous rain-water which drains through the Soil or Vegetative Stratum: whether the Retention proceeds from the tenacity of the Subsoil itself, or from Retentiveness of some inferior Stratum.

‡ This is a peculiar species of Soil; it is uncommonly adhesive and difficult to plow. It is particularly mentioned in MIN. 175.

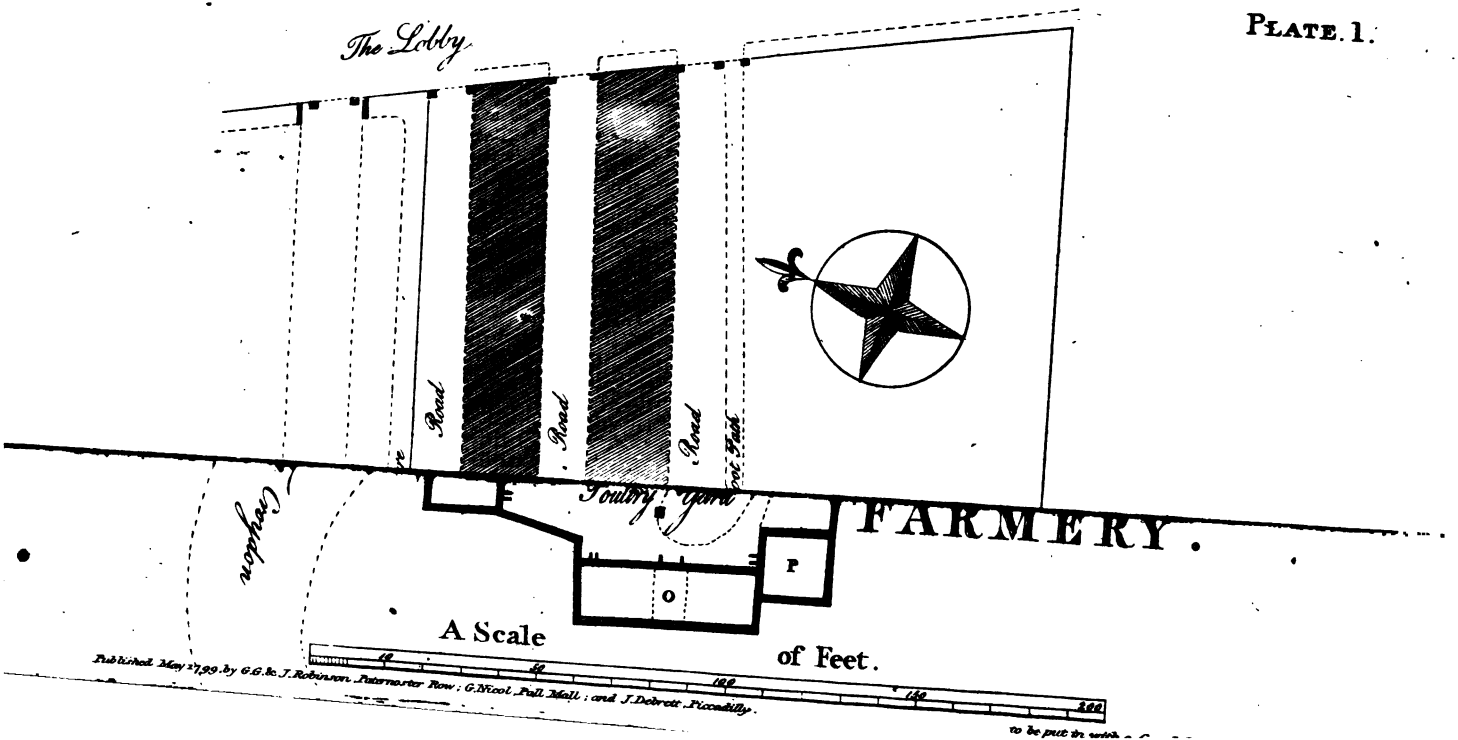
Names.	Size.	Soil.	Subsoil.	Aspect, &c.
E. 2.	$2\frac{5}{8}$ Acres	Adhesive Clayey Loam	Retentive	Very gently Western.
3.	$4\frac{3}{4}$ —	Clayey Loam	— —	Gently Western.
F. 1.	$4\frac{1}{4}$ —	Black Moory Sandy Loam	Quicksand	Eastern; but nearly level.
2.	$5\frac{1}{4}$ —	— — — —	— —	— —
G. 1.	$4\frac{1}{2}$ —	Strong Sandy Loam	— —	— —
2.	$5\frac{3}{4}$ —	— — — —	— —	— —
H. 1.	$3\frac{1}{2}$ —	Spungey Sandy Loam	— —	— —
2.	$6\frac{1}{2}$ —	Sandy Loam	— —	— —
I. 1.	$5\frac{1}{2}$ —	Strong Sandy Loam	— —	— —
2.	$6\frac{1}{2}$ —	Loam	Retentive	Gently Eastern.
K. 1.	$1\frac{7}{8}$ —	Clayey Loam	— —	Level.
2.	$5\frac{1}{4}$ —	Mellow Clayey Loam	— —	Western; but nearly level.
3.	$11\frac{1}{2}$ —	Tenacious Clayey Loam	— —	Nearly level; inclined to North.
4.	$6\frac{3}{8}$ —	— — — —	— —	Very gently Western.
L. 1.	$20\frac{1}{4}$ —	Clayey Loam, Loam and Sandy Loam	— —	Very gently Northern.
2.	$4\frac{3}{4}$ —	Tenacious Clayey Loam	— —	Very gently Western.
M. 1.	$5\frac{1}{8}$ —	Loam and gravelly Loam	Various	Gently Northern.
2.	$3\frac{1}{8}$ —	Loam	Retentive	Very gently Western.
3.	$4\frac{1}{8}$ —	Rich gravelly Loam with moory plots	Various	Very gently Northern.
4.	$3\frac{1}{2}$ —	— — — —	— —	Gently Northern.
5.	$1\frac{1}{2}$ —	Gravelly Loam	Absorbent	— —

Names.	Size.	Soil.	Subsoil.	Aspect, &c.
M. 6.	4½ Acres	Gravelly and Boggy	Various	Gently Northern.
N. 1.	5 ——	Gravelly Loam, &c.	Absorbent	— —
2.	3 ——	Sandy gravelly Loam	— —	— —
3.	3 ——	Strong gravelly Loam	Various	Various.
4.	3 ——	— — —	— —	Various; chiefly Southern.
5.	4¾ ——	Gravelly Loam	Springy	Various; chiefly Northern.
6.	4 ——	Gravel and gravelly Loam	Various	Gently Northern.
7.	1⅜ ——	Strong gravelly Loam	Retentive	Bold to the South.
O. 1.	13½ ——	Gravelly Loam with moory Plots	— —	Various; chiefly Northern.
2.	2 ——	Sandy gravelly Loam	Absorbent	Gently Western.
3.	2¾ ——	Part gravelly; part stiff	Various	Part Northern; part Southern.
P. 1.	4 ——	Gravelly Loam and moory	— —	Gently Northern
2.	12 ——	Varied gravelly Loam	Absorbent	In general, full to the North.
3.	4 ——	Strong gravelly Loam	Retentive	Gently Northern.
R. 1.	2⅜ ——	Gravelly sandy Loam	Absorbent	Very gently Northern.
2.	1 ——	— — —	— — —	Gently Northern.
3.	½ ——	— — —	— — —	— — —
4.	0⅞ ——	— — —	— — —	— — —
5.	2 ——	— — —	— — —	— — —
6.	1¾ ——	Gravelly strong Loam	Retentive	— —
S. 1.	1½ ——	Spungey sandy Loam	Springy	Level.

Names.	Size.	Soil.	Subsoil.	Aspect, &c.
S. 2.	$1\frac{1}{2}$ Acres.	Spungey sandy Loam	Springy	Level.
3.	$1\frac{1}{2}$	—	—	—
4.	$1\frac{1}{2}$	—	—	—
5.	$1\frac{1}{2}$	—	—	—
T. 1.	$0\frac{1}{4}$	Sandy Loam	—	—
2.	$1\frac{1}{8}$	—	—	—
3.	$2\frac{1}{8}$	—	—	Gently Eastern.
	4	Clayey Loam	Retentive	—
4.	$5\frac{1}{8}$	—	Various	Level.
U.	4	Sandy Loam	Absorbent	—
	$269\frac{1}{8}$			
	$21\frac{7}{8}$ Hedges, Roads, and Waste.			
	291 Including Fences, &c.			

The relative situations of the several fields are seen in the prefixed Map of the Farm.

PLATE. 1.



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to be put in with

The HOMESTEAD, or principal FARMERY, at which I resided, being placed on one side of these scattered fields, added to the difficulties of management.

The PLAN of this FARMERY (see the annexed Plate) was chiefly my own; the dwelling house and one barn being the only given points: the extent, however, was limited, by the adjoining common: a circumstance which rendered the plan less complete, than otherwise it might have been made. But the size was proportionate to the lands which properly belonged to it; and its conveniences were numerous. I therefore give a sketch of it;—to convey hints on a subject, which is little understood: having, until of late years, had little attention paid to it; though of the first importance, in rural concerns.

EXPLANATION OF PLATE I.

The LOBBY is entered from the COMMON, and opens into the GARDEN FIELDS, a suit of ARABLE FIELDS, the PASTURING PADDOCKS, and the STACK YARD.

FARM YARD. A, A, &c. the *gangways*, or footpaths, round the yard. B. the *granary*. C. a *chaff house*. D. a resting place, for the *yard hogs*. E. the *poultry house*, communicating with the *roost*, over D. F. a *stallion stable*. G. the *chaff bin* of the cart *horse stable*. H. the *harness closet*. I. a *collar-maker's shop*. K. a *carpenter's shop* and *lock-up toolery*. L. an *open* or *outer toolery*.

COW HOUSE. (1) the *gangway*, before the head of the cows. (2) the *troughs* or mangers, for their food. (3) the *calf pens*.

OX SHED. On a similar plan to that of the cow house.

SWINERY. (1) the wash cisterns. (2) a pavement, furnished with troughs, for the yard hogs. (3) the outer sties. (4) the covered sties. (5) the troughs, for the stied hogs: opening, by flaps, into the boiling house. (6) the boiler. (7) the boiling house, and repository of roots, &c. sunk three feet below the level of the yard.

COURT YARD. M. a large latticed *breeding coop*. N. the *saddle horse stable*. O the *dwelling house*. P. *offices*.

INTRODUCTION

TO

THE MINUTES.

IT MAY reasonably be expected, that I shall here set forth my pretensions to become a writer, on a subject of so much difficulty as Agriculture, without a larger acquaintance, with the professional part of it, than I may seem to have had, at the commencement of these Minutes.

It will appear, however, by the Minutes themselves, that, at their commencement, at least, they are merely statements of facts, as they occurred, in the course of business; and might have been put down, with propriety, by a person wholly unacquainted with the general subject, and having no other ground work to go upon, than the practice which passed before him.

But this was far from being my own case. I set out with advantages, which cannot

readily be acquired, by those who have not been *born* to the profession. I was bred up in it, from my infancy. During the first fifteen years of my life, I might be said to have had it daily under my eye, and to have conversed on no other *practical* subject;—to have been taught the use of every tool and implement; to have performed every operation; and to have been initiated in almost every branch of the profession.

Even during my alienation, from the profession itself, I had frequent opportunities of observing its practices; and this, in situations different from that in which I had been bred up; and thereby of obtaining more comprehensive ideas of the subject, than ever could have been furnished, by my native soil, alone. It was, indeed, during this period, and in occasionally seeing, and perhaps partaking in, my native practice, that I primarily formed a true estimate of the profession; and a few years residence in a distant climate; and there seeing (though incidentally) the works of cultivation carried on, under circumstances still more different, might farther enlarge my comprehension of the general subject,

and assist to impress more strongly, on my mind, the radical benefits arising from Agriculture, comparatively with the fleeting advantages of commerce.*

Some few years previously to my *return* to the profession, I made AGRICULTURE my particular study: and it was then, I first analyzed the general subject, and originally formed the synthetic arrangement, which all the experience, I have since had, has not found occasion to alter, in any essential point.

Therefore, I trust, it may be said, with propriety, that I set out with advantages, *peculiarly* suited to the task I was undertaking.

IN THIS place, it may be requisite to offer an apology, for the manner in which the FIRST EDITION of these MINUTES were laid before the Public.

They were *written*, as *private* memorandums, and *printed*, as an *anonymous* work.

* It is worthy of remark, that men who have resided, in the East or West Indies, though engaged there in commercial pursuits, frequently return with strong propensities to Agriculture.

The style was purposely left unpruned, and the sentiments unvarnished, for reasons given, in a retrospective view of the work, after it was printed; and many new constructed words were suffered to remain, for reasons which no one, I believe, will controvert, and which I here copy: "The Author, throughout the preceding volume, has considered AGRICULTURE as an INFANT SCIENCE, destitute of SYSTEM, and, in some measure, destitute of SCIENTIFIC TERMS. An impropriety and ambiguity of terms have ever been the bane of science, as a perspicuity and propriety have ever aided in its advancement. In what state would the MATHEMATICS, PHILOLOGY, EXPERIMENTAL PHILOSOPHY, and ASTRONOMY, have now been found, had there not existed INNOVATORS OF TERMS? If the writer has introduced a redundancy, or an impropriety, of terms, he is ready to retrench or alter them."

I must confess, however, that the work, in many respects, was left unguarded, and exposed to public censure; and I have long been sensible of the indulgent treatment it met with.

RESPECTING the PRESENT EDITION, I have only to say, that I have endeavoured to free the first from its exuberances, without destroying the primary intention.

The retrenchments are fewer, and of less extent, than I had preconceived to be necessary: and I have great satisfaction in being able to say, that, possessed of my present experience, I have not had occasion to correct more than one round assertion of a radical error (respecting raygrass) in that my probationary publication.

MINUTES

IN THE

SOUTHERN COUNTIES.

1.

FARM MANAGEMENT.

1774. July 18th. YESTERDAY, discharged my bailif; and determined to be, wholly, my own manager: to regulate tomorrow's conduct, by today's experience; and next year's plan of management, by the result of this year's practice.

2.

HARVESTING HAY.

JULY 26. Began to carry hay: got four loads into stack;—caught in the rain, with two more on the waggons; left four or

five in the field, fit to be carried;—the stack and waggons abroad. 2. HARVESTING HAY.

In future, I will accord to the adage—"carry hay while you may." Part of it was ready yesterday; but I was unwilling to break the dayswork of a plow team.

3.

AUGUST 9. The men and boys are unanimous in their dislike of the oxen. The buying of them was unluckily premature. Their keep has, thus far, been treble the value of their labor, and they must now lie a dead WORKING CATTLE.*

* It is as absurd to distinguish animals, which Nature sent into the world *red and white*, by the name of *Black Cattle*, as to call those which never had, nor were ever intended to have horns, and of course *hornless*, *Horned Cattle*. Nor is it less ridiculous to suffer a word, so altogether *English* as CATTLE, to remain in the ENGLISH LANGUAGE, without a determinate signification. The Writer, therefore, makes no apology for adopting it, as the general name of Bulls, Cows, Oxen, Steers, Heifers, and Calves, whether they happen to be black, or white, horned or hornless; nor for using it in the singular, as well as the plural, analogous with *sheep* and *swine*.

3. weight, till after harvest. They have been
WORKING CATTLE. the cause of more impertinence, vexation, and bickering, than all the other appendages of the farm.

JULY, 1777.* These were four oxen, bought in Sussex, the preceding spring; at a time when the Writer was fully employed, in the ordinary business of the farm; besides the immediate superintendance of a new farm yard, and suit of offices: —and this Minute is inserted, as a hint, to those who wish to introduce *something new*; for if it should interfere with the *necessary business of the farm*, ten to one it will miscarry.

4.

HARVESTING BLIGHTED WHEAT. AUGUST 20. Last Tuesday's rain had a remarkable effect, on mildewed or blighted wheat. On Monday, the grain was small, shrivelled, and *steely:* on Thursday and Friday, it appeared plump and *kind.* The longer it stands, the more it seems to improve.

Is not this a sufficient hint, for suffering

* The time when these MINUTES first went to press.

blighted wheat to have some rain, in uncovered shucks? 4. HARVESTING.

5.

August 30. Brought down, from Adscomb, eight sacks of *oats in chaff*, for the cart horses. Would it not be ridiculous to winnow them? Surely, to dress oats, intended for private use, is muddling through a dirty, suffocating job, without any other advantage, than that of having the pleasure of remixing the corn and chaff, in the stable. WORKING HORSES.

July, 1777. This may be plausible theory; but, in evidence that it is not eligible in practice, those were the first and last oats the Writer gave to the horses, without winnowing. The quantity of *corn* cannot be ascertained: some oats afford a greater proportion of chaff, than others; and the carters were of course dissatisfied: besides the inconveniency of carrying a quantity of weed seeds into the stable, and from thence to the dunghill. OATS in CHAFF.

6.

6.

BUSINESS of HARVEST.

SEPTEMBER 3. A fine day. Carried the remainder of O 2. Part of N 5, &c. &c. A number of little obstructions continued to retard us, all the morning; and greater in the evening. Obliged to leave part of what was ready, in the field, uncarried. But this was *our day of misfortunes.*

In future,—bustle in the morning, and defy the little difficulties of the day.

7.

HARVESTING BEANS.

SEPTEMBER 6. Going this morning among the bean cutters, a thought struck me, that *drawing* (eradicating) would be preferable to *cutting* (with sickles). On making the experiment, I found that I could draw them, faster, and *much cleaner*, than the workmen cut them; besides leaving the land, in a state greatly superior. The waste too is less—scarcely a bean is lost. Being perfectly clean, from weeds and grass,

the beans are immediately ready to bind, and set up, and the roots, by lifting them from the ground, give the air a free circulation. By striking the roots of each handful, against the foot, the mold is almost wholly disengaged from the fibres; and the soil in the rows, instead of being bound by the roots, and encumbered by the stubble, is left as loose as garden mold; while the surface is freed from obstructions. 7. HARVESTING BEANS.

8.

SEPTEMBER 18. In June, mowed swaths across a field of barley, and a field of oats, to try its effect on the grasses, which were sown with the corn, in the spring. The green corn was given to the cart horses. LEYING.*

The result is this: the parts mown are perfect mats—the young grasses are much ranker and stronger, than those under the standing corn: they, and the second crop of corn, would have made an excellent summer pasture. The second crop of oats,

* LEYING is here used for the process whereby arable land is reduced to sward, to grassland, to *a ley*.

8. though puny, was in full head when the
LEYING. first crop was cut.

JULY, 1777. If green fodder and pasturage be wanted, this may, in some cases, be eligible management.

9.

TIME of SOWING. SEPTEMBER 25. A great quantity of rain has fallen.—The whole country is deluged. —In some parts of Kent, and on the Hills of Surry, the farmers are in the midst of harvest. It is true, the beans only are now out; but the oats, and some of the barley, are but indifferently got, and had the incessant rains set in, only a few days sooner, they must have been much injured.

In future,—endeavour to be before, rather than behind, the seasons.

10.

WEATHER. OCTOBER 2. "What a wet season! The "like was never known!" is the general cry. But is not every year—almost every

season, remarkable for something? And, indeed, the greatest wonder is, how the rains and fair weather come so regularly as they do. 10. WEATHER.

In future,—EMBRACE THE FAIR OPPORTUNITY, AND PREPARE FOR THE UNCERTAINTY OF SEASONS.

11.

OCTOBER 17. Finished taking up the potatoes, and spreading the compost of F. 2. The crop is not large, but the roots are fine. POTATOES.

JULY, 1777. Led by the idea of making compost useful, while in a state of maturation, and of culturing and cleansing the soil, while a crop is produced,—in each interfurrow of a foul wheat stubble, lying in halfrod beds, I strowed potatoe plants;—covered them with rows of *long* dung, (strawy, undigested dung)—and reversed the ridges, as if no dung, nor potatoes, had been deposited. During summer, plowed and cleansed the beds, and hoed and earthed up the potatoe rows. And, in autumn, COMPOST FALLOW.

11. COMPOST FALLOW.

opened them, with a plow,—gathered—harrowed—re-gathered—and spread the compost over the intervals, with shovels.

An improvement would be: instead of covering the plants with the dung, first bury the dung, and afterwards dibble in the plants; and instead of plowing and harrowing up the potatoes, dig them up, and cleanse the compost by hand-picking.

An evil attendant, on this method of making COMPOST FALLOWS, is the being prevented from cross-ploughing, during summer. And see the close of MIN: 255.

12.

SUMMER FALLOW.

NOVEMBER 5. By way of experiment, sowed two ridges of the exhausted foul part of Barn field, a bean stubble, with wheat.

MAY, 1775. Plowed it in.—*Good for nothing.*

JULY, 1777. This field was summer-fallowed, and sown with wheat, the ensuing autumn, *without manure:* yet the crop was good;—from three to four quarters, an acre. It is now in clover, as clean as a garden;

and the Writer is convinced, that summer-fallowing, if the soil be foul, is the most *spirited* of all spirited managements; and if one summer will not cleanse it, it is doubly spirited to give it two. 12. SUMMER FALLOW.

13.

NOVEMBER 22. It is one man's employment to supply the horses with oats, and no vent for the straw. To thrash oats in autumn, while the cattle are yet abroad, is unpardonable management.* BARN ECONOMY.

In future—save a stack of oats, until the eve of harvest, sufficient to supply the horses, until the cattle be taken up; at least till Martinmas. Straw in haytime is necessary for thatch, and useful to mix with indifferent hay, or second crop of clover. Fill the barns with wheat; laying such as will show for a seed sample, easily to be come at. Begin thrashing, as soon as convenient, and have them cleared, by Martinmas, ready to throw in spring corn and pulse, for fodder for the strawyard stock—

* Yet nothing is more common.

13. BARN ECONOMY

oats for the cart horses—peas for the hogs, &c. &c.—The wheat in stack will take possession, in the spring, when the strawyards are shut up, and this again give way to the reserve of oats.

At any rate, do not make a shameful waste of straw, by having oats to thrash in October.

14.

LEYING.

DECEMBER 5. Plowed furrows, in K. 2, to take off the water, which stood on the surface:—the young grasses were totally covered, in many places, and, in others, buoyed up by the foliage, which swam on the surface.

I am convinced that a stiff, level, retentive soil may be *leyed* too flat, and that this field ought to have been gathered up, into wide gentle ridges. The furrows, which we drew today, are but a *partial* relief to it, are at present very uncouth, and will be troublesome in the spring.

The condition of this field must still be very hurtful to the young trefoil, clover, ribgrass, &c. and the dung cannot, with any

propriety, nor conveniency, be strowed in the water. 14. LEYING.

JULY, 1777. The Writer is still clearly of opinion, that a *retentive* soil ought to be *acclivated*, whether it be intended to produce corn, or grass;—with this difference:—for winter corn, the ridges ought to be high and narrow;—for grass, low and wide. Perhaps, half a rod wide, for the former,—two rods wide, for the latter. SURFACE DRAINS.

It is true, the grasses did not perish; but, though the soil is clean, in tolerable heart, and fine tilth, this field has never yet borne a middling crop; excepting the upper headland, which lies perfectly dry. It is observable, that this part begins to vegetate, much earlier, than the part which lies flat and wet. The sun has here double duty:—first, to exhale the superfluous moisture, and then to throw in an extraordinary degree of warmth, to rouse the benumbed fibres. When that has secured its surface, from the spring drought, this is but beginning to shoot; and the dry weather setting in, while its surface is wholly unshaded, it is of course baked to a crust, and the crop stinted.

15.

DUNG YARDS.

DECEMBER 7. Shot a load of gravelly loam, in the gateway of Adscomb farmyard, to prevent the road water from overflowing it, and carrying away the essence of the manure.

It is bad management to suffer the water, which falls immediately upon dung, to drain *from* it, wastefully; and much worse, to suffer that which is extraneous to drain *through* it: yet how commonly it is seen, in practice!

16.

THRASHING WHEAT.

DECEMBER 7. How necessary is it to attend narrowly to the thrashing of wheat! Two fellows, whom I have employed for some time, have been cheating the public in general, and myself particularly, for more than a fortnight past; yesterday, I ordered half a load of the straw, which they had bound for sale, to be drawn from the rest, indiscriminately, and re-thrashed. To-

day, we have cleaned up, above half a bushel of prime wheat! Covered them with shame and disgrace, and discharged them, *publicly*, as a warning to the rest. 16. THRASHING WHEAT.

17.

JANUARY 3. Yesterday, put the remainder of the fatting hogs to peas.—Cabbages take more boiling, and are not so well affected, as potatoes, and have a most disagreeable smell. CABBAGES.

JULY, 1777. The writer has not since *boiled* any cabbages;—but, given *raw*, he finds them of great use to the yard hogs, particularly the SUCKLING SOWS. SWINE.

18.

JANUARY 8. Counted the produce of a double stem of purple or Cape beans, from one root, which has been a piece of parlour furniture, since harvest. It had, when BEANS.

18. BEANS. drawn, upwards of ninety pods; but some of them were immature, I now opened,

2	pods of	5	each, 10 beans.
12	- - -	4	- - 48
37	- - -	3	- - 111
27	- - -	2	- - 54
7	- - -	1	- - 7
85	pods		230 vegetative beans.

Put up the fives and fours—the threes—and the twos and ones, in three separate papers, to try, hereafter, whether the seed which springs from a root, specially fruitful, is, or is not, in itself, peculiarly prolific; and whether the particular circumstances of its production influence its produce.

VEGETABLE ECONOMY. JULY, 1777. These beans were drilled, in a piece of the same species.—The particular produce of the pods of different sizes, were identified by labels, and the experiment rigidly attended to. But, at harvest, the smallest degree of disparity could not be discerned; the bean which was brought forth, singly, being equally fruitful, with that which was produced, in a pod of five or six: and that which was produced, on a stem of ninety, was not more fertile than

its neighbour, grown on a stalk of fifteen or twenty. 18. VEGETABLE ECONOMY

19.

JANUARY 21. Two men have been six days, each, in thrashing out three quarters and seven bushels of wheat! At four shillings, a quarter, (the agreement) they did not, (including a shilling a load for the straw) earn common day wages, though they thrashed hard, and stuck close to it:—but it was *got in damp*. The straw thrashes to pieces, and the corn is *cold*. HARVESTING WHEAT.

In future—Be careful not to carry wheat, into *barn*, while damp, if it can possibly be avoided. Perhaps, in general, there is more danger of harming it, in the mow, than in the shuck.*

20.

JANUARY 24. Horse-raking M. g. The dung, laid on one side of it, was much too *long*, for a sward—too undigested to dissolve with the rains. It lies in tufts, on the MANURING.

* Especially in a bad wheat year, like that of 1774.

20. surface, and the grass under it is yellow, and
HORSE RAKE. rotten. The horse rake makes good work. It gathers up the undigested, pulverizes and scatters the digested, and scarifies the turf.

FERN LITTER. What rakes up is chiefly FERN; some of it, as entire as when brought from Norwood: though it has been in the dung, near twelve months. This is a heavy charge against fern. Perhaps it delays the maturity of a dunghill, a full year longer than straw. Perhaps, straw, at fifteen shillings a load, is more eligible litter, and *cheaper*, than fern at five.

JULY, 1777. The Writer, convinced, from this and other observations, that fern retards, very considerably, the maturation of manure, has not used it since; except in cases of great scarcity of litter, for the barns and stack frames.

But he does not hereby mean to decry fern, wholly: it may be very eligible in many situations. Nor does he mean to convey an idea, that the manure, produced from it, is of an inferior quality, to that produced from straw; but, on the contrary, to expose that received vulgar error:—for he is of opinion, that manure from fern

thoroughly digested, is as meliorating, and as free from *infection*,* as that which is made from straw; and, where it can be kept *separate*, fern may be very eligible, as cart-horse litter. 20. FERN LITTER.

21.

JANUARY 28. Finished carrying off the fern rakings. The rake left them, in rows, out of which they were shook into heaps, and returned, in carts, to the farm yard, for litter. This is a neat, and evidently a good job: the surface is discumbered, and the digested dung worked thoroughly into the sward. DUNGING SWARD.

Experimentally, raked one rake's width, harder than the rest. Tore much of the clover and raygrass up by the roots. Will it invigorate the plants, which are lacerated, but not eradicated, or will the frost perish the exposed fibres? Remember,—the upper part was raked, in the afternoon, preceding a *very sharp frosty* night. SCARIFYING SWARD.

* A popular idea, in this country, is, that fern breeds smut.

21. SCARIFYING SWARD. JUNE, 1775. No obvious difference: the whole field bore a very large crop.

22.

PLOWS. JANUARY 30. Last week, I procured two Yorkshire plows, (to be drawn by two horses, without a driver)—and to day got one of them to work. The man and horses were as tractable as could be expected, from a first essay, and make very good work, in a light soil. A boy and a horse are saved, and the soil beneficially trodden: besides, two horses, *in rank*, step quicker, much quicker, than three, *in file*, and seem to carry off their work, more cheerfully.

23.

SOWING SOOT. JANUARY 30. Last spring, I set two men to sow soot, over wheat. They stript themselves naked, and, not being used to it, narrowly escaped suffocation. I was hurt to see them; and then made a resolution not to sow any more, until I could contrive an implement,

which would scatter it, with some degree of comfort to the laborer. 23. SOWING SOOT.

Since then, I thought of one: last week I built it; and tried it, today; but the wheels are too narrow—they cut in, three or four inches deep: instead of one man, it requires two men, to draw it. Ordered a pair of old wheels, much broader, to be fitted to it.

24.

JANUARY 30. By a comparative experiment between *chopping* stubble, (cutting it with a sithe against the foot) and collecting it, by rolling in frost, and gathering it up, with a horse rake, in open weather, the expence was nearly the same. The rake leaves less upon the ground, and eradicates many weeds; but the stubble is only fit to litter the yard with. The sithe gathers it freer from dirt, and it is litter for the cart horses. STUBBLE.

In future,—if horse litter be wanted, chop stubbles;—if not, rake them.—It raises a greater quantity, and leaves the surface much cleaner: Besides, raking *across* the

24. STUBBLE. ridges scarifies the surface, at right angle to the direction of the plow.—O. 2. breaks up like a fallow.

25.

WORKING CATTLE. FEBRUARY 3. Harnessed the oxen, in all their new finery;—their fringes and tassels;—their gaudy bridles and housings. The Pantheon never saw more ridiculous macaronies. But what is still more ridiculous, the very men, who fancied it beneath them to associate with *oxen*, are now ambitious of being the companions of HORNED HORSES! and their new name, and *finery*, have had the desired effect.

In the field they behaved very well; but coming into the yard, one of them broke loose, with his trappings upon him, and put the pigs and poultry in bodily fear;—a bated bull was never more furious; and it is well that it ended in fear.

NOSE RINGS. 4. Got a nose ring made, for the riotous OX.

JULY, 1777. This thought arose, from seeing a mischievous bull, in Yorkshire, tethered by the nose. The Writer, however,

was very reluctant in making use of it: indeed, nothing but necessity (for this ox was become truly dangerous) could have persuaded him to it;—for he was afraid, that it would give the men an opportunity of torturing him. However, to the credit of their humanity, he believes, it was never made use of, for that purpose. 25. NOSE RINGS.

6. Rung the rebellious ox. The operation is easy. The farrier first attempted to *punch* the hole, to receive the ring; but a *penknife* opened it much better. The nostrils, above the large cartilage which separates their extremities, are divided only by two very thin membranes, that are easily perforated. The *ring* is about three inches in diameter.

7. The rung ox is as passive as a spaniel, and leads like a cur.

26.

FEBRUARY 10. Yesterday, a sow farrowed, and last night she overlaid one of her pigs. This has frequently proved the case; and, *perhaps*, in future, give sows very BREEDING SOWS.

26. little litter, the first week after farrowing.

BREEDING SOWS. Perhaps, a dry platform is the most natural.

JULY, 1777. No: for if a sow farrow in the field, she collects a quantity of grass or weeds, and makes herself a soft, dry, warm bed; therefore *some* litter is natural: nevertheless, *much* is, undoubtedly, dangerous.

27.

FARM YARD MAN: FEBRUARY 15. Shovelling the gangways of the farm yard, and re-littering them.

Littering farm yards is an eligible practice;—it *forwards the digestion* of stubble, or offal straw, and makes the yard comfortable.

28.

WORKING CATTLE. FEBRUARY 16. The points of the shoulder blades of one of the oxen are exceedingly swelled. His shoulders are made aukwardly for harness. They protuberate, at the top and bottom, and leave the middle hollow.

Perhaps, choose the ox for harness, whose shoulder blades are thin, and withers fine—

whose shoulders, from the withers to the elbow, are convex, rather than concave, and whose elbows are short, and blunt. But, perhaps, a collar may be contrived to fit a shoulder, be it ever so hollow. 28. WORKING CATTLE.

A cart ox ought to be handsomely made, deep chested, straight and clean limbed, short horned, full shouldered, active, *spirited*, and carry his head high.—DUKE, if possible, is perfect.

29.

FEBRUARY 23. Began to prepare for drilling beans, in K. 4. The common flat harrows, (large harrows for four or more horses) I find are totally unfit for narrow ridges. Perhaps, a pair of concave harrows, with the horses drawing single, in the furrows, would be best. HARROWS

30.

FEBRUARY 25. This field (see above) a raygrass ley of eight or nine years old, was gathered up, early in winter, into halfrod LANCE.

30. ridges to be sown with beans:—but the ley
LANCE. being quite flat, and of course wet (the soil a retentive, clayey loam), it broke up, as tough as glue, and the harrows cannot raise mold enough, to cover the seed. I have therefore been contriving an implement to lacerate the surface, that the harrows may have more effect. It is still too wet to bear the horses: an implement which can be drawn by the horses, walking in the furrows, is therefore necessary; and that which I have made, and got to work, to day, resembles a horse rake, with a joint in the middle, and the two arms crooked; to fit, exactly, the round half rod ridges. Instead of teeth, the arms are furnished with blades, four inches apart, ten inches long, and about two and a half broad at the top, growing narrower towards the point; resembling hangers, with the points dragging somewhat behind the implement.

31.

STACKS. FEBRUARY 27. The late stormy night has shifted almost every pillar of a wheat stack. It is extraordinary how it stood out

the tempest! Had it fallen, during the rain, the damage must have been considerable. 31. STACKS.

In future,—attend well to stack frames, before the hurry of harvest begin.

32.

FEBRUARY 27. The good effect of setting out the ridges of the twenty acres, and opening the cross drains, is obvious. Last spring, a man could not walk over it, without danger of sticking in the mire. This spring, it is firm as a race ground, notwithstanding the late wet weather. SURFACE DRAINS.

JULY, 1777. This is another field spoiled, by being leyed flat. It had, the preceding winter, while the farm was without a tenant, been trodden by large cattle, to mere mortar. The whole twenty acres did not, in the year 1774, more than summer two cows. It was the latter end of May, before any stock could be turned into it; the surface was so wet, and the grass so backward: nor could it, with any propriety, have been *plowed*, until the latter end of April. Lest this should be the case, the ensuing spring (it being totally ruined as grassland) a pair LEYING.

32. LEYING. of furrows were laid, back to back, at every half rod, and cross drains opened, to carry off the water, which these furrows might collect. This was done, in autumn, before the surface was again reduced to mortar, and it had fully the desired effect. Instead of the latter end of April, the plows began to work, in February. These furrows became the middles of the ridges; so that instead of five, there were, now, but four turnings to be made to each ridge.

33.

BEANS. MARCH 1. Began *casting* the drawn beans (throwing them from one end of the barn floor to the other, with a shovel); but this is of very little service. They are full of lumps of dirt, which are too large to be sifted out, and too heavy to be blown out; —nor does casting separate them.

This is a bad effect of drawing beans (see MIN: 7.); and I was anxious to remove, or at least to palliate, it. After some successless attempts, I put about half a bushel into a sack, and thrashed them, for a few seconds.

They were then shook in a wheat riddle, and came out a good sample. The flail bursts the clods, and the *wheat* riddle lets the dust, and the small refuse beans, through it. 33. BEANS.

This is a valuable discovery: for there is an advantage of drawing beans, which (besides the benefit the soil receives) will more than pay for the extra labor, in cleaning: they are as hard, as old beans, though *housed* immediately after the deluging rains of last autumn. The stubbornness of the roots, I apprehend, keeps the mow open, and admits a circulation of air.

34.

MARCH 1. Yesterday, harnessed the young oxen, and put them into a team of horses. Those very oxen, which were, last year, so extraordinarily rebellious, are now, since they have been rung, (though they have been well fed, and done no work these seven months), as tractable as horses! They were led into the field like a brace of pointers, and scarcely made one licentious effort. WORKING OXEN.

35.

35.

CONCAVE HARROWS. MARCH 16, Tested a pair of CONCAVE HARROWS. (See MIN: 29.) They fit exactly, the halfrod ridges. I am perfectly satisfied with them; and Thomas Good-old-way cannot smother his approbation. The handles are very convenient.

	£.	s.	d.
The cost of the wood work,	1	0	0
Of the iron work	2	10	0
	£. 3	10	0

For an engraving of these harrows, see PLATE II.

36.

DRILLING BEANS. MARCH 18. What a disadvantage attends the drilling of beans! When other people were *sowing*, at random, we were only *preparing*, for the drill. The rains are set in—They have gained, and we have lost, a very fine season.

37.

37.

MARCH 22. Tested a pair of *fine* concave harrows, on the same principle as those of the 16th, but much lighter. Those were made for four horses; these for two:—those lacerate, at every two inch and half; these at one inch and quarter:—those are for breaking rough ground; these for *finishing*; which they do very highly. CONCAVE HARROWS

38.

MARCH 23. Attempted to break up P. 3. for oats, with a whip-rein plow; but could not go on. This field is too stiff, for the light Yorkshire plow, and two horses; especially at present; for being deposited *flat*, the water has stood on it all winter, and run the soil, which has formerly been chalked, to a bed of cement. Nevertheless, a large plow and four horses make good work in it. TILLAGE.

38. PLOWS. *Therefore*,—Howsoever eligible a light plow and two horses may be for light land, a large plow and four horses are, in some cases, requisite for stiff land.

39.

TILLAGE. MARCH 24. Began to break up S. 1. with a whip-rein plow, and two horses; which, there, make charming work: cutting it up seven or eight inches deep, with ease. But the soil is a sandy loam. See the last MINUTE.

40.

RAISING HEDGES. MARCH 24. Watering the young quick-sets of the foot path fence, with *dung water —yard liquor*. Carried it out in a water cart, and poured it into the trench, with pails.

Here, the advantage of planting quick-sets, in a trench, is evident. See PLATE IV.

41.

MARCH 25. Three men have trifled away the whole day, in making up six quarters and seven bushels of oats. This is more than half as much, for cleaning, as for thrashing. A winnowing mill, of twenty pounds cost, would repay it, the first winter. WINNOWING MILL.

JULY, 1777. And yet the Writer has not purchased one! This proves the prevalence of custom, and the danger in adopting bad practices. It is the custom of this country to "*make up*" with sackcloth fans. The Writer found two on the premises. They were set a going—and they still go round. CUSTOM.

The difficulty of getting a good one, and the extravagant price of the bad ones, made in London, may be pleaded in excuse.

42.

MARCH 29. Yesterday, put a strong hack (a saddle horse) into the plow team. And today, put him to one of the whip- PLOW HORSES.

42. PLOW HORSES.

rein plows. Also put another into the team —He went and worked, like a cart horse.

JULY, 1777. Cast-off coach horses, or saddle horses, if strong, though slightly lame, do very well for whip reins. If the work be light, they step quicker, and, if not too gay, are preferable to heavy cart horses, for reins; as being tenderer mouthed, and better to guide.

43.

CABBAGES.

MARCH 30. Finished planting early cabbages.

Remember, the roots of the plants, planted on the first land, were dipped in train oil to preserve them from grubs: last year, at least, one plant in four suffered by them.

Experimentally, put a grub, which had already lodged itself in one of the roots, into the oil; it was instant death. Perhaps, if the oil is not too powerful for the plants, it may not only preserve, but invigorate them.

OCTOBER, 1775. Several of the plants died, and those which survived were not better than the rest of the plot.

JULY, 1777. The grub is a great enemy to cabbages, and a preventive is worth looking for. If train oil, alone, be too strong, perhaps, dilute it. Perhaps, soot may answer the purpose. 43. CABBAGES.

44.

MARCH 31. Fencing garden field, against the hogs; which have already destroyed a number of the cabbage plants. They are in perpetual mischief. HOGS.

This evening, took a pair of dog couples, and coupled two of them together. For a while, they were obstinate as hogs, each contending for his own *way*: but, after eating a handful of barley together, they became more amicable.

45.

APRIL 4. Tested a pair of fine *flat* harrows, on the same plan, and of the same dimensions as the fine *concave* ones—(See MIN:37.) But the beams of these are straight. HARROWS

45. INVENTION. July, 1777. It is dangerous to generalize ideas. The Writer, from seeing the great utility of jointed CONCAVE harrows, had conceived it barbarous to drag a harrow by the corner. But howsoever eligible a pair of square harrows, joined together, and drawn side foremost, may be for *round ridges*, he is fully convinced of the admirable simplicity of the COMMON HARROWS; and of their utility, on a *flat surface*. Their greatest demerit lies in their not being capable of having handles fixed in them;—and, for weedy ground, HANDLED HARROWS are preferable.

46.

HEDGERS. APRIL 7. Finished spring fencing, this evening.

I have, this year, agreeably to the custom of the country, "*allowed wood*" (given each fencer the right of taking home a bundle of fire wood every night). This is a very ill judged custom.—I caught one of the hedgers, the other night, carrying home, as much prime wood, as was nearly worth half his day's wages.

In future,—give them their price, but do not give wood ;—for if they are not thieves already, this will make them such. 46. HEDGERS.

47.

APRIL 13. Yesterday a horse which had been thrown, for want of attention, upon a pair of harrows, overturned in the field, died of his wounds. HAZARD of FARMING

This morning, I had him brought upon a sledge, from the hovel where he died, and placed opposite the stable door, with this label upon him ;—" see the effects of carelessness ! let this be a warning to you all." The youngsters flocked round him : those who could read were anxiously communicative, to those who could not ; and their minds may have received lasting impressions. His ears and dock, placed over the stable door, may serve as a daily caution to the carters. MANAGEMENT of SERVANTS

48.

APRIL 14. Finished drilling beans. The drill has, at length, performed its PULSE DRILL.

48. PULSE DRILL.

work, exceedingly well. It is still in the rough; but it may easily be made a complete implement. Its merit lies in its simplicity,—its expedition,*—and in that the seed, in a *loose soil*, is covered in the act of drilling; without harrowing, or any additional labor, or machinery.

The looser the soil, and the finer and evener the surface, the better, of course, it works. But it has not yet refused any soil, nor any surface. However, on *stiff land*, it is necessary to cover the seed.

The sharpness and position of the coulters make it equally fit, for stiff, or for light land. If the surface were moist, it would even deposit seeds in ley ground, without plowing. See PLATE II.

49.

HORSE BROOM.

APRIL 15. Swept in the beans of K. 4. thus: Nailed some rough long heath, by the means of a strong broad lath, to the front of the lance (see MIN: 30), and with this

* Two men, with one horse, drilled five acres, a day; not a shilling, an acre.

went, once in a place, in every furrow. It effectually covered the beans, and left the ridges as smooth as swept gravel walks. 49. HORSE BROOM.

This implement was made, in five minutes, at not sixpence expence. The blades keep the heath from breaking down, and the heath prevents the blades from cutting. It exactly fits the halfrod ridges,—wants no guiding,—is easy work for one horse—and is far more effectual than the harrow.

50.

APRIL 16. Two pair of whip reins have plowed exactly seven acres, in three days. Two three-horse teams, in that short, cross work (in a common field) would have made four of it. TILLAGE.

What a saving!

	£.	s.	d.
Three horses 3*s*. 9*d*. a man 20*d*. a boy 10*d*. 8 days -	2	10	0
Two horses 2*s*. 6*d*. a man 20*d*. 6 days - -	1	5	0
	£. 1	5	0

A saving of just one half!

50. TILLAGE. Surely, there must be some error in the calculation!—No—not the shadow of one. But, for the sake of calculation, suppose they plowed equal quantities:

Three horses 3*s.* 9*d.* a man 20*d.*			
a boy 10*d.* - -	0	6	3
Two horses 2*s.* 6*d.* a man 10*d.*	0	4	2
	£. 0	2	1

There is still a saving of one third;—and I am positive that all the horses, and all the drivers, in the county, could not have made better work.

51.

HORSE BROOM. APRIL 18. Sweeping Rivulet Mead with a straight HORSE BROOM (see MIN: 49); made by fastening holly twigs, against the front of the beam, or head, of a common horse rake; by means of a rail of equal length, with skrew bolts passing through the two; thus confining the holly, in an upright posture, between them: the points, or lower ends of the twigs, reaching a few inches below the teeth of the rake; and, when in work, dragging somewhat behind them; yet, on

a level surface, bearing their points from the ground. 51. HORSE BROOM.

I have long wished for an improvement of the common "bush harrow." Bushes (thorns or other rough boughs) soon wear down to the *wood*, and then *plaster* the surface. Whereas this bears solely on the *prickles*, or sprayey points of the twigs. A bush harrow of a proper size, requires two horses:—This, *by touching where it acts, only*, requires but one, and is incomparably more effectual: not a worm-cast can escape it. Besides, the teeth of the rake pull down the little protuberances, which fall in their way, and the surface is left beautiful.

52.

APRIL 20. Planing, and re-harrowing Upfield. The PLANE reduces the clods, and disengages the root weeds, in a very extraordinary manner. LAND PLANE.

JULY, 1777. This implement was made in the spring of 1774, before these Minutes commenced, the Writer was then leying some fields, and wished to leave their sur-

52. LAND PLANE. faces level, fine, and smooth. After several attempts, and repeated alterations, he succeeded in an implement, which perfectly answered his intentions. But he was not then aware of its use to a fallow. He only wished for a *surfacer*, or *land plane*: for an implement which would give a beautiful bowling-green surface. However, he has since used it, and still continues to use it, with great success, on fallows. It pulverizes and *mixes* the soil, and disentangles the root weeds, in a manner highly beneficial. See PLATE II.

53.

DRILLING CARROTS. APRIL 20. Finished drilling carrots. The channels were opened by six *splayed coulters*, (see PLATE IV.) fixed, a foot apart, in a light beam of seven feet long, drawn by a T handle, by one man, walking backward. The seed was scattered, by hand, in these trenchlits, and covered with a hand rake.

If carrots in rows be eligible, and a draw-drill be wanted, a more simple one need not be desired.

54.

54.

APRIL 25. (See MIN: 23.) Before the rain, the soot ran like quicksilver:—now, it clogs the roller of the sowing cart, and with difficulty leaves the hopper. SOWING SOOT.

In future,—sow soot, immediately after fetching; it incorporates, by lying in the cart; even in dry weather.

55.

APRIL 27. Finished cross-plowing C. 1. FARMS.

What a disadvantage attends *stiff land*, *small fields*, and *straggling farms!*

This plot, of only two acres and a quarter, has taken four four-horse teams, to give it the second plowing, for barley!

What a disparity of expence, between this and the second plowing of P. 2!—See MIN: 50. TILLAGE.

Four teams at 7*s*. 6*d*. is 30*s*. or 13*s*. 4*d*. an acre!

13*s*. 4*d*. less 3*s*. 7*d*. is equal to 9*s*. 9*d*. the difference of expence, in one plowing!!!

55. But how can this be? surely, there must
TILLAGE. be some mismanagement, in this case. There may be so; but it is such mismanagement as will ever attend a scattered farm, be the farmer ever so alert. The disparity arose thus:

SOILS. In the first place, the soil being broken up, in the beginning of winter (and that was the proper time to break it up) when it was wet, this remarkably dry spring (and who can hinder a remarkably dry spring?) had baked the surface to bricks. It was like ploughing the surface of a rock.

PLAN of FARMS. In the second place, the field is short, and crooked-hedged; and long teams take more time in turning, than short ones.

Lastly, this is a corner which lies detached from the rest of the farms, and I was fully employed, at a distance from it, of nearly two miles. The servants knew this, and probably embraced the opportunity of being dilatory. This alone, perhaps, made a difference of half a team. Besides, the field plowed, with whip reins, lies within a hundred yards of the stable, in which the horses were fed; this field, upwards of a mile from it.

JULY, 1777. On transcribing the preceding Minute, the Writer referred to the labor account, of the Division C, to see whether the breaking up, and the succeeding stirrings, bore any parity with this cross-plowing. The account stands thus: 55. ACCOUNTS

		Teams.	Men.
Nov. 23 to 29.	Breaking up -	3	
April 26 & 27.	Crossing - -	4	
May 10 & 11.	Stirring - -	2½	
June 10.	Harrowing and spikey-rolling -	1	
11 & 12.	Re-stirring - -	3¾	
29.	Surfacing - -	0½	
July 1.	Harrowing, sowing with turneps and harrowing	0½	0¼
Aug. 22 to 25.	Plowing in the turneps	3½	
30.	Sowing 4¼ bushels of wheat - -	—	0¼
30.	Covering it - -	0½	
Sept. 5.	Raking and picking -	—	3
		19¼	3½

Thus it appears, that the five plowings cost sixteen teams and three quarters; and therefore the teams, on a par, did not plow more than two thirds of an acre, a day. Such is *one* of the disadvantages of *stubborn soils — small inclosures*, and *detached farms!*

56.

56.

BARLEY FLUTE. APRIL 29. Sowing barley, in O. 1. over a fluted surface.

We got in near seven acres, today. The FLUTE forwarded us much. With the six splayed coulters, (see the 20th) and a pair of old shafts, one horse makes a *finer surface*, and, where the soil is clean, rids as much ground, as half a dozen plows. It sets the soil, after being rolled, raked, &c. in regular ridgets, nine inches apart; leaving channels (resembling the flutes of a pilaster) about three inches deep.

JULY, 1777. "Necessity is the mother of invention." The season was far advanced, and the Writer had more work to do, than horses to do it with. The soil was tolerably clean, and in fine tilth; but, after couching, the surface was left quite smooth, and it was necessary to raise it into inequalities, by plowing, or some other process, in order that the seed might be effectually buried. The carrot drill occurred; but the coulters stood too far apart, and did

not make the channels deep enough. He therefore put them nearer together, in a shorter beam, which he fixed to the ends of a pair of useless cart shafts, and strapped on a pair of slight handles. The alterations were made, and the implement in the field, in a few hours,—and fully answered the purpose intended. 56 INVENTION.

JANUARY, 1799. As an expedient, at the close of a season, this method of putting in barley may sometimes be highly beneficial.

57.

MAY 2. Last night, put four bushels of barley, into two sacks, and immerged them in the dung water, in the farm yard. This morning, *dried* the seed, with wood ashes, and sowed it on No. 40, and 42. The water swelled it out, considerably; and perhaps, this dry weather, it will vegetate quicker, than the seed sown dry. STEEPING SEED BARLEY.

JUNE, 1775. The steeped has no apparent preference to that sown dry,—*in this experiment.*

58.

58.

ROLLING NARROW RIDGES.

MAY 5. Rolling the oats of the Twenty Acres.

High, halfrod ridges are bad to roll. The carter was going *straight across*, in the common way. Every furrow was enough to shake his horses and roller to pieces. Ordered him to go *somewhat obliquely* (enough to prevent both ends of the roller from falling in at once, but not so much as to hinder their reaching the *bottoms* of the furrows, one after the other), and the disagreeable effect was entirely done away.

59.

GEN: MAN: of CROPS.

May 10. Finished sowing barley.

E. 1. is still exceedingly rough; and as there is no appearance of rain, it would be folly to think of sowing it, with barley, *for corn*.—I will therefore sow it, with tares and barley, to defend the clover, and give the green *herbage* to the cart horses, or make it into hay. C. 1. is in the same predicament.

This, I will endeavor to get ready for turneps, to be plowed in, for wheat. Perhaps it is—indeed, it certainly must be—a good principle of management, never to sow out of season. P. 3. was, last year, sown on this very day. It was caught in the autumnal rains, and entirely spoilt for malting. When barleys, sown but a few days before it, were ready to cut, this was perfectly green. 59. GEN: MAN: of CROPS. TIME of SOWING.

Perhaps, *in future*,—Never sow barley, before the middle of April, nor after Old Mayday.

JANUARY 1799. This, as a general rule, in ordinary SEASONS, would be difficult to improve. But the time of the YEAR is not the most accurate regulator of the time of SOWING. See the following OBSERVATIONS: also MIN: 125. NORFOLK, and MIN: 82. MIDLAND COUNTIES.

60.

MAY 13. Continued breaking up G. 1. *land for land*, thus: FALLOWING.

The team began, yesterday, on the right-hand side of the field, and plowed *a 'bout* (an

60. FALLOWING. *about*, a *turn*—a pair of furrows) in each furrow*, (in each *inter-furrow*) until it reached the left-hand side. The plowman then be-

NOMENCLATURE. * How difficult the task to write intelligibly (it would be weakness to attempt to write elegantly) on infant sciences! The term *furrow* has, in Agriculture, three or four distinct significations, and must of necessity be a source of perpetual ambiguity; it signifies, the soil turned by the plow, and the trench left by the operation.—It signifies the interval between two ridges, and the cross drain, which receives the rain water, collected by these intervals.—JOHNSON adds a fifth; but he mistakes furrow, for *drill*, or misunderstands MORTIMER.

How shall the Writer conduct himself? Shall he be guilty of the sin of ambiguity, or of innovation? He will not hesitate; for the one is deadly, the other only venial; and he trusts that the See Critical will grant him a dispensation.

But he finds it difficult even to sin; and confesses, that he was never more puzzled, in coining a word, than in the present instance.—JOHNSON's general definition is, "any long trench or hollow." This includes three out of the four significations abovementioned;—but *the soil turned*, has no claim to it whatever; nor, perhaps, does it strikingly resemble any thing:—a bad furrow, it is true, might be compared to the *leaf* of a book, the *list* of cloth, or a *slice* of bread; but a good furrow is nearly *square*, and the ideas have no intimate connection.

Will analogy help us? A spade-full is called a *Spit*, and, by analogy, a plow-full may be called a *Plit*.

gan again, on the right-hand side; and, to-day, he is again working towards the left; and will thus continue, 'till the field be finished. 60. FALLOWING.

By this mode of plowing, each furrow (each *plow-furrow*), and the fresh-formed surface of each *plit*, may lie one, two, or more days, in proportion to the size of the field, and width of the lands, *exposed* to the

But there are still three ideas which lay claim to the word *Furrow:* NOMENCLATURE.

The trench made by the plow;
The collateral drain;
And the cross drain;

which the Writer will distinguish, when distinction is necessary, by

The Plow-Furrow;
The Inter-Furrow;
The Cross-Furrow.

How unthankful soever the office of Nomenclator may be, the reader will be able to judge, from this Note, that it is not the most delightful thing in the world; for the Writer has scarcely introduced, or altered, any term, which has not cost him a train of ideas, bearing some resemblance to those above registered.

As a proof of the ambiguity of this term, it is clearly the *Plit*, which is meant, both by MORTIMER and DRYDEN; and which even Dr. JOHNSON mistakes for a "small trench."

60. FALLOWING. weather. As for instance, if the field be laid up in fivebout ridges, and contains five acres, and but one team at work in it, each furrow will be exposed, one day; if ten acres, two days; if fifteen, three; and if twenty, four days. During this interval of time, the air is let in, and the soil *sweetened;* the roots of weeds lie obnoxious to the sun, and the insects and grubs to the birds; which, while the team was working, on one side of the field, were, I perceived, busy feeding, in flocks, on the other.

By plowing in the common way, *land after land*, the majority of the root weeds are re-covered, in a few minutes; and, perhaps, in some degree invigorated, by being transplanted into fresh mold; the birds are intimidated by the presence of the team, nor have they *time* to feed, were they ever so bold;—the insects, instead of being exposed to these and the weather, are presently lodged in commodious cells, fit, perhaps, for the purposes of propagation. And to counterbalance these apparent, indeed obvious, advantages, I cannot discover one evil attendant. It is even conveni et t the plowman: he is under no necessity of being crampt, at the

ends—the team may always take sufficient room, for turning—and the cattle may be eased, by turning, "offward," or "toward," at pleasure. 60. FALLOWING.

JULY, 1777. Fallowing is a more important part of Farming, than even *Farmers*, in general, are aware of;—and the Writer was well pleased with this mode of breaking up, until the more eligible one of BALKING occurred. (See MIN: 158.) But although balking is more eligible, for *breaking up*, and exposing a large surface to the atmosphere, plowing land for land stands unrivalled, in *stirring*;—and yet this mode of stirring a fallow never occurred to him, till this moment*.

What a proof is here of the frailty of the human mind, and of the use of making Minutes! After the Writer had adopted the method of breaking up fallows, by balking, he never more thought of plowing, land for land;—nor would it, perhaps, have ever reentered his mind, had he not retained it, in the preceding Minute. MINUTING.

* By stirring is here meant a plain ordinary plowing of loose ground.

61.

61.

SOWING SOOT.

MAY 13. Sowed seventysix bushels of soot, on G. 2.

They took two men, and one horse, half a day—and therefore cost, in sowing, 2*s.* $3\frac{1}{2}$*d.* which is about 3-8ths of a penny, a bushel. The chimney-sweepers charge a penny, and do not sow it nearly so even, as the sowing cart.

This soot was sown, immediately after fetching, and nothing could work better. See MIN: 54.

62.

WORK-MEN.

DOUBLE HANDHOE

MAY 13. Gave a workman a reward, for his expertness, and willingness, in using the DOUBLE HAND-HOE.* Instead of drawing it after him uniformly, he strikes—gives it a jerk—at every step. This is a very great improvement; and the work goes on full as fast. It keeps the edges free, and makes them take the grass, be it ever so tough.

* See PLATE II.

JULY, 1777. An Inventor (of Instruments of Agriculture at least) has done but half his work, when he has constructed his implement. The best mode of using it is sometimes more difficult to ascertain, than the best mode of construction. Perhaps, many valuable inventions have perished, for want of patience, attention, and perseverance, in the practice of them. 62. INVENTION.

A person habituated to analogous implements, is more likely to perfect a new one, which he uses, day after day, and from morning till night, than one who tries it, for a few minutes. And the farm servant, who endeavors to improve a new implement, is worthy of encouragement.

63.

MAY 16. Plowing a pair of plits, in each interfurrow of the wheat of Barn Field. HOING INTERFURROWS.

Why? I mean it, 1st. To destroy the weeds, which generally abound in the furrows—2d. To gain an even sample—(the furrows are latest ripe—the corn puny—and the grain, of course, small and thin.)—

63. 3d. To facilitate the weeding.—4th. To pre-
HOING IN-TERFUR-ROWS. vent its lodging.—5th. To make it yield.

The intervals form breaches, which prevent the plants of one land from supporting, or being entangled with, those of another; and, of course, increase their motion. The motion of vegetables is their exercise; and, perhaps, to exercise, vegetables, as well as animals, owe their strength and health.

The attendant evils, which occur, are the labor, and the destruction of some of the plants. The former is trifling.—A man, a boy, and two horses, would do six or eight acres, a day.—And the latter is more than counterbalanced, by the smallest of the proposed good effects, and totally vanishes in the last.

64.

MIXING COMPOST. MAY 16. Finished the mixen of O. 3.

This was a heap of digested potatoe halm, couch and mold, covered with dung. The laborers began, in the customary way of the country, to *turn* it—to throw down the top, which was wholly dung, and to bring up the bottom, which was entire

mold, to cover it with. This by no means answered the purpose intended. I therefore ordered them to *mix the ingredients*;—one man to cast the dung, the other the mold, *on a slope*. 64. MIXING COMPOST.

JULY, 1777. The Writer has since found, that a still more effectual way of composting a mixen, of various materials, is to hack it down with a pickaxe or mattock, as if it were a bed of gravel, or some other hard substance to be dug away, and then cast it, *on a slope*, with shovels. If the face of the mixen be kept upright, the hacking at once breaks the materials into small pieces, and mixes them together. He has, for some time past, practised this method, uniformly.

65.

MAY 19. Winnowed the trodden beans. DRAWN BEANS.

One man, I find, has trodden between two and three quarters, a day. (But he is an old man, and had his trade to learn.) Therefore, pulling beans incurs an extra expence, in cleaning, of *7d.* or *8d.* a quarter.

65. DRAWN BEANS. *Treading*, I find, is more expeditious than *thrashing*, (See MIN: 33.) and does not damage the sack so much. About two bushels, in a four bushel sack, seem to be the properest quantity.

66.

FALLOWING. MAY 20. Began to re-fallow B. 3. This field was fallowed, last summer; but it was so exceedingly foul, and the weather setting in, wet, we could not get in a crop of wheat, with any propriety. In winter, it was gathered up, in fivebout ridges, perfect mortar, interwoven with the roots of couchgrass. The men and horses worked to their knees, in mire. An extra man could scarcely keep the plow free, from *couch*. I would not even venture a crop of drilled beans, in the spring, for fear of the *couch*; which lay dead on the surface, in mats, and which, I apprehended, was alive in the soil. But, on beginning to slit down the ridges, this morning, not a trace of live couch appears! the little which remains, undissolved, is black, and rotten.

This, I remember, was precisely the case of the upper part of T. 3. It was landed up in winter, *as foul*, and *as wet*, as it could be worked. When we came to stir it, for barley, the couch, it is true, was there, but it was without any *appearance* of life. 66. FALLOWING.

How is this mystery to be cleared up? Does plowing, in winter, *very wet*, kill couch? Both the fields lay very flat. B. 3. as flat as the land plane could make it.

Perhaps, in future—Lay couchy land flat, and roll it, in winter.—Fix a scraper to a heavy roller.—Land up the mortar. ROOT WEEDS.

JANUARY, 1799. This minute is re-printed, to agitate the subject of TILLAGE. Plowing land, when wet, is, in some cases, evidently wrong. But it may not be so, in all.

67.

MAY 20. Sowed, over the barley of Footpath field, six pounds of ribgrass, six pounds of trefoil, and four pounds and a half of white clover, an acre. LEYING.

JULY, 1777. The Writer prides himself on the management of this field.—Indeed,

67. had he occasion to ley a thousand acres of
LEYING. retentive soil, he would not deviate, *far*, from the process used in this instance.

In 1774, part of it was summer fallowed (because very foul), part of it was beans in rows (because tolerably clean), and the whole had an April fallow, in the remarkably dry spring of 1775.

By the last plowing but two, it was gathered up, into halfrod ridges, which were cross-harrowed; and, by the next plowing, thrown two into one. These rod lands were likewise harrowed and *planed* across; which pulled them down considerably, and reduced them to gentle swells. By the last plowing, two of these were gathered into one large land, two rods wide.

PLOWING. This last operation required some skill in the art of plowing; for had it been performed by one plow, carrying an equal plit, there would have been a hollow on each side of the middle of each land. To prevent this, the insides were plowed, with a wide sterned plow, in deep narrow plits; and the outsides, with a narrow sterned plow, in shallow, wide plits. Cross-harrowing, and cross-planing, added to this precaution, reduced

them to beautiful, gentle inequalities; sufficiently acclivous for rain water to drain off, without washing away the soil, or giving offence to the eye. 67. PLOWING.

These *waves*, which the land plane had left as smooth as gravel walks, were then raised into flutes, sown with barley, and harrowed, once in a place, by a pair of small harrows and one horse.

During the hard frost of January, 1776, the young grasses were meliorated, with about five and twenty loads of compost, containing ten or twelve loads of dung, an acre.

The ensuing summer, they were eaten down, by cows, and afforded a great deal of pasturage. The pasturing was of infinite service: and if there are positive rules in agriculture, this is one—PASTURE A LEY THE FIRST YEAR.—For, at harvest, the Writer was much dispirited; and, during winter and spring, the whole field had a bald and shabby appearance: there did not seem to be plants, nearly sufficient, to form a sward. He put some confidence, however, in the dung and the pasturing, and his expectations have been fully satisfied; LEYING.

67. for, this spring, a more lovely carpet was
LEYING. never seen.

WHITE CLOVER. There is an advantage of pasturing white clover, which the Writer was not, until a few days ago, aware of. Each joint of the stem furnishes a fresh root, (and of course a fresh plant) whenever such joint comes in close contact with a soil it affects; and, consequently, the richer and barer the surface is, and the more it is trodden, the thicker it will get upon the ground.

LEYING. The *spontaneous bladegrasses* are now springing up very thick among the aftergrass, and bid fair to form a *natural sward*, by the time that the *cultivated herbage* be worn out: and on this seems to hinge the prime principle of leying: *furnish the soil with* CULTIVATED HERBAGE, *until the* SPONTANEOUS GRASSES gain strength enough, to form a NATURAL SWARD.

68.

HOING WHEAT. JUNE 1. Finished hoing the wheat of the Four Acres.

The hither side of this field is a very bad foul crop;—the further side as fine wheat

as can stand on the ground. This wanted very little hoing, but the other a great deal :—the weeds had almost overcome the wheat, which must, before harvest, have been smothered, had it not received this timely hoing. 68. HOING WHEAT.

Perhaps, generally,—If wheat is thin, weeds are numerous, and hoing absolutely necessary to tolerable management.

JULY, 1777. Hoing wheat is spirited management; but it is a tedious, expensive business. If wheat be very straggling, as the abovementioned plot was, it ought, certainly, to be hoed, or plowed in.*

69.

JUNE 2. *Laborers want looking after.* Yesterday, I was in town ;—today, at home. The two plow teams, and the eight weeders, did as much work, today, before noon, as they did the whole of yesterday. They were happily situated for gossiping WORK-PEOPLE.

* This was written before I had the least knowledge of the practice of GLOCESTERSHIRE.

69. and mirth;—the teams on one side of a
WORK-PEOPLE. hedge, the weeders on the other.

70.

MOWING GROUNDS. JUNE 9. Mowing weedy grass, by the side of the rivulet, in the meadows.

The weeds are now tender, and full of sap, and make good green forage. Had they stood (as they did last year) until the rest of the herbage be fit to be cut, many of them would have shed their seeds, and their dried stems have marred the hay stack.

That which was cut, today, is worth 20*s*. to the working horses and oxen. Beside, the second crop will be fine enough, to mix with the meadow hay, without injuring it.

71.

EFFECTS of DROUGHT JUNE 10. We have had only one shower of rain, during the last three months! Yet the crops, which covered the ground, when the drought set in, still hold their vigor.

Wheats, in general, look well, and so do early sown oats, and barley. But much of the late sown barley is not yet up, though sown a month ago! 71. WHEAT.

The backward meadows, and upland leys, are mostly burnt up. But M. 3. and M. 6. which were dunged in winter, and got a head, in the spring, are very fine crops.

Grass of each species *yields*, this year, remarkably well. N. 1. which seemed scorched up to the very bents, and which I had laid at less than half a load of hay, an acre, has yielded full three quarters. Instead of shrinking, I think it has swelled, after cutting! How is this to be explained; except that dry weather gives more substance, wet weather more sap? MEADOW HERBAGE.

And what seems equally astonishing; cows, this dry summer, milk well, and look sleek and healthy, in pastures as brown as fallows. But, perhaps, the *substance* is there, though in a small compass, and the adjoining rivulet supplies the *sap*. COWS.

72.

FARMS. JUNE 10. Perhaps, arable lands, lying round the farmyard, are cheaper, at 20*s.* than those of the same quality, a mile from it, at 15*s.* an acre.

Two teams went, yesterday, to *stir* the fallow of C. 1. They did not plow more than an acre! I have just been over the wheat at Norwood, and find it, in patches, smothered with Mayweed; and the crop having got into blow, before the discovery was made, it is become dangerous to weed it. Had it been near home, I should have been over it, fifty times, and it would have been all hand-hoed, or hand-weeded, long ago.

FARMING. I find it an AMUSEMENT to attend to contiguous crops; but a toil to have the care of those which are scattered. The stroll is inviting, while the fields are connected; but even half a mile of rough, dirty, by-road, mars the enjoyment.*

* And this must be more or less the case, on every disjointed aggregate farm, let the manager be ever so active, or ever so plodding.

73.

73.

JUNE 15. Continued *breaking up* for wheat, M. 6. a raygrass and clover ley, of three years old. MIDSUMMER FALLOWS.

The teams, here, do not plow more than half an acre, a day, each. For, beside the distance from home, the soil is so exceedingly dry, and gravelly, the plowmen are obliged to have their shares sharpened twice a day. This is a disadvantage of breaking up ground, in summer. But are there no advantages to stand against it? Yes.—Two load of hay, an acre, this year of scarcity; and a breaking up, in dry weather.

74.

JUNE 17. Put twelve *couple* of hogs to the sour grass and weeds, in P. 1. See MIN: 44. COUPLING HOGS.

The whole, except the sows and young pigs, have now been coupled, a month. Two of them got entangled, under a gate, but without any harm; and one of them was

74. COUPLING HOGS. lamed, but whether from coupling or not is uncertain: otherwise they have gone on very well; have been perfectly manageable; have gone on the common, with scarcely any other food;—and, considering the season, look very well. They are now in a field, with only common fences, picking up that, which, without the couples, must have been wasted.

75.

WEEDS. JUNE 19. Mowing weeds, every where, for the suckling cows.

COWS. This is literally turning evil into good—weeds into milk. The stubs, in many of the borders, hinder the sithe. Remember to grub them up.

76.

OX COLLARS. JUNE 20. At last I am pleased with a WOODEN OX COLLAR!

I have tried a variety of forms. My original idea was a pair of large wooden hames. But I mistook the construction of

the shoulders of an ox. They are, in general, very much concave, or hollow;—and I wrung them at the points and tips. 76. OX COLLARS.

Finding that tallow, absorbed by hair, prevented a tender shouldered horse from galling, I made them convex, and covered them with leather, stuffed with hair and tallow.

In these they worked very well, all spring seed time. But the bottom pieces hooked the traces, at the turnings, and gave the whole a clumsy appearance. The spring pins, too, which fastened them, at the top, were tedious, and the whole expensive, complex, and uncouth.

At length, I have thought of one, which is much preferable: instead of the hair and tallow, I have substituted a wooden bolster; instead of the bottom piece, an iron spring bow; and instead of the spring pins, catches.

The nine pins—another sort—have a simplicity in them, which pleases me; but the men do not seem to like them, so well as the bolsters.

The idea of a wooden collar arose from this observation: When a horse galls, it

76. OX COLLARS. generally proceeds from some knot or lump in the stuffing; and, let straw collars be ever so *hard*, if they are *smooth*, they seldom gall. The truth of this observation is fully proved, on the oxen's shoulders, for they are become as firm and smooth, as the wood itself. See PLATE III.

I have just finished one, on the same principle, for a tender-shouldered horse; and he is now at work in it. Duration (including cheapness,) neatness, ease, and coolness to the horse, are the proposed good effects.

77.

HONEY DEWS. JUNE 22. This morning, there was a remarkable honey dew. The leaves of the oak were not *sprinkled*, as is usual, but *varnished*, with a sweet, shining, viscous matter; which, on some leaves, had run into large drops: with a little trouble, a quantity might have been collected. I tremble for the effect!

JULY, 1777. Several oaks and other trees were blighted; but the corn did not receive any obvious injury.

JANUARY, 1799. This corroborates the idea, that honey dews and blights are incident to the plants on which they appear, and are not communicated by the atmosphere. See the DISTRICT of CANTERBURY. 77. HONEY DEWS.

78.

JUNE 24. Earthed up the cabbages, and early potatoes, with a double-mold-board plow. A neat, expeditious job. DOUBLE PLOW.

JULY, 1777. This implement is too common, to need a particular description; and too useful, in opening furrows, and earthing up potatoes, or cabbages, to be left wholly unnoticed. Those whose mold boards move on hinges, and may be set wide or narrow, at pleasure, are the most convenient.

79.

JUNE 28. On Monday, the barometer got to extreme light. It began to rain about nine o'clock, and rained till three. This finishes a drought of upwards of three months. WEATHER

79. BARLEY. The major part of the seed barley, which was sown in E. 2. the beginning of May, was yesterday as sound, firm, and bright, as on the day of sowing! This rain may, indeed, make it vegetate; but it can never make it come in time for a crop:—Besides, the few plants which are already up, will be ripe long before it.

JULY 4. The remainder of the barley of T. 3. which was sown the 9th of May, just two months ago! is now coming up, as even, as if it had been sown but a few days. That which came up, presently after sowing, is now in ear. What a motley it will be, at harvest! E. 1. and E. 3. are in the same predicament.

JULY 7. By way of experiment, mowed two lands of E. 3. in order that the first and second comings up may ripen nearly together, at harvest.

JULY, 1777. This had not the desired effect;—the part mown down was in ear again, before the last coming up had covered the clods.

80.

JULY 1. Sowed C. 1. with turnep seed: the turneps to be plowed in, for wheat. FALLOWING.

I now consider this field, as a clover ley, which has been once mown, and the second crop of which is intended to be plowed in, for wheat. The more seed weeds, which now vegetate, the better:—the more food there will be for the wheat.

This is shortening the business of fallowing; and, if the soil be clean from root weeds, it is, perhaps, better management, than stirring it, in the throng of haytime and harvest; beside raising nutriment for the succeeding crop.

JULY, 1777. If a fallow be thoroughly clean, from root weeds, it is certainly an eligible practice, to sow it with the seeds of some quick-growing herbage, in the wane of July, or the beginning of August, to be plowed in, for wheat, in the wane of September. PLOWING IN HERBAGE.

But to lay up a fallow, in the beginning of July, which is not *perfectly cured* of its

80. FALLOWING. COUCHINESS, is very injudicious management. C. 1. is a *living* witness for this assertion.

81.

MAKING CLOVER HAY. JULY 1. I have adopted this method of making mixgrass and clover hay;—especially, when the ground is *cold*.

Let it lie to wither, in swath; but while it is tough—before it be crisp—make it into small light cocks, and rake the bared surface. As the cocklets become dry, aggregate them; and continue to rake the bared grass, till the hay be dry enough, and the cocks large enough. If rain beat down the cocklets, catch a dry opportunity of turning them upside-down, and *lightening them up;—not shaking them out.* Thus, keeping it out of harm's way, and preserving the *leaf*, *sap*, and *color*.

82.

QUANTITY of SEED BARLEY. JULY 1. The barley of O. and P. is, and was, from its first coming up, choaked with seed weeds. A neighbour sowed some, at

the same time, in the same common field (a GRAVELLY LOAM), which is clean, and, at present, a promising crop. I sowed *two* bushels, over-plit;—he, *five* bushels at least, half over, half under. His came up very thick—smothered the weeds—and kept the ground moist:—Mine thin, with an abundance of seed weeds;—it could not branch for want of rain,—and the soil is of course exposed to the drought. 82. QUANTITY of SEED BARLEY.

But see the OBSERVATIONS on WHEAT, 1777.

83.

JULY 4. Began to cross-plow M. 6. (the second plowing of a tough raygrass ley). PLOWS.

Tried it first with a swing plow: the sods gathered under the beam, and threw it out. Took out the surface plow of a two-wheeled trenching plow, and tried it: the tough plits wedged in, between the coulter and the breast, and threw it out. Took the coulter entirely out: the false coulter drove them before it, into large heaps. Put the coulter into the coulter hole of the surface plow; and no plow could go better.

83. PLOWS. This is a striking instance of the utility of making the coulter hole, at a considerable distance from the breast of the plow. Perhaps, a foot and a half is little enough. In this instance, the coulter stood, at least, three feet before the plow, without inconvenience.

INVENTION. JULY, 1777. It is dangerous to generalize ideas, hastily. The Writer, fully convinced that the coulter might be set eighteen inches before the breast of a *wheel plow*, took it for granted, that the same rule might be applied to the *swing plow*, and he built one on that principle: but it did not answer his expectations. It was unsteady; and if a stone, or other obstruction, threw it out of its work, into the furrow, it was almost impossible to get it into the land, again. At present, he is of opinion, that the point of the coulter of the swing plow (a plow without wheel or foot) ought not, except it stand very high, to precede the point of the share. The precise situation of the coulter hole depends, therefore, on the shape of the breast, and the length of the share. See MIN: 180.

84.

JULY 8. See the 1st. A fine afternoon.— Got the remainder of D. 1. and K. 2. into larger cocks: the middle-sized cocks, everywhere, are almost fit to carry, notwithstanding the sun has not shone, these three days. HAYMAKING.

I apprehend, had this hay been treated, in the common mode of haymaking, it would have been black, if not rotten; whereas the flowers still retain their bloom, and the leaves their verdure.

85.

JULY 11. Something, perhaps, by way of SUPPORTERS, is absolutely necessary to tares. Farmer ——— had a field of winter tares, which, early in the spring, looked remarkably well. He is now cutting them. They are, at the root, quite black and rotten: only their tops are eatable. Those in N. 5. which have rye and wheat to support them, are green to the ground, and are, at least, of double the value of his, though, in the spring, TARE HERBAGE

85. they did not appear to be half the crop.
TARE HERBAGE The one is three or four feet high—the other beaten flat to the ground.

86.

HAYMAKING. JULY 11. See the 1st. To try how the cocklets would make in middlesized cocks, *without lightening up;* I piled three, one upon the other, without shaking them. In this manner I made two rows in C. 2.: the rest of the field, two cocklets together, shook up. The former was, *in this instance*, the greenest, finest hay.

87.

WHEAT. JULY 13. In the year 1773, C. 1. was a remarkably fine crop of wheat.

Today, I inquired of the bailiff, who had then the management of it, the treatment of this field.

CLOVER. It was simply that of dunging a clover ley, as soon as the first crop of clover was off. The second crop of clover, he says, was not

great; but the wheat was "the crack of the "country." 87. CLOVER.

Does not this confirm the propriety of the idea of feeding on a firm surface, and contradict that of the volatility of vegetable food?

The second crop of clover, it is said, was not good; because no rain fell to wash in the dung: but before wheat seedtime, the manure became incorporated with the soil, and gave the fine crop which followed. TIME of MANURING.

The dung (being laid on in July) was of course exposed to the exhalation of the Dogdays' sun—and the "plant-feeding par-"ticles," consequently, "dissipated."

But if so,—who, or what, recalled these itinerant particles, to the identical field, from whence they took their flight?

Whence soot, then, and its vegetative quality?

Soot is forced up a small aperture, by a strong fire; not raised, in the open air, by the comparatively feeble influence of the sun. Because a chimney will suck up a Bank note, is it therefore dangerous to expose Bank notes to the sun in Dogdays, for fear of their being exhaled!

88.

88.

HAYMAKING. JULY 19. The stack of mixgrass hay (See the 1st, 8th, and 11th.) takes a very fine heat; notwithstanding it was out *three weeks of rainy weather.*

JUNE, 1776. There was not a speck of mould, nor a handful of musty hay, in the whole stack.

89.

TARES. JULY 21. Cutting tare herbage, for the working oxen.

OXEN FORAGE. On clover, they throve very well:—but not so, on the weedy grass of the margins. On tares, however, they are doing exceedingly well.

How idle to assert, that oxen cannot be used, as beasts of draft, without grasslands to graze them on.

90.

LABORERS. JULY 22. Some of the men having worked, at the hay, later than ordinary, I began

this evening (Saturday) to pay them 6*d.* each, for "over hours." 90. LABORERS.

The first man was thankful; but the second began to talk of an advance of wages: whereas, had I given him his 10*s.* only, he would have gone away satisfied.

I begin to think, though with reluctance, that hard work and low wages are the best means of making good servants. The rest went away, perfectly satisfied, with their common wages. It is at least *hazardous*, to give them more than they *expect*. —— See GENERAL REMARKS on SERVANTS.

91.

JULY 23. The BEST TEAM spoils the carters: ——— was a good servant, before he had the *best team*; but this made him consequential, and impertinent. ———, too, while he had the best team, was a man of consequence: since I took it from him, he is much improved. Gave it to ———. As soon as he found himself likely to keep it, he also began to think for himself. He SERVANTS.

91. SERVANTS. conceived wooden collars to be wrong; and that it is not the first carter's business to load hay; at least, without a prong. I have given him the rips, instead of the best team, and he is all submission.

It is dangerous to grant a favor to *ignorant* servants: and certain mischief, to *seem* to grant it.

92.

DIRECTION of RIDGES. JULY 26. The wheat, on the North sides of the ridges of G. 2.—I. 1.—H. &c. which all lie, East and West, is green, while that on their South sides, is turning yellow: there are several days' difference in their degrees of ripeness.

Those which lie, North and South, are equally ripe on both sides.

93.

NEW CART. JULY 28. Carrying the hay of the margins, &c. with two oxen, and the new cart. See PLATE IV.

This is a sight I have long wished to see,

in reality. I find the idea in a Minute I made, five years ago. They brought a tolerable load *up* to the stack, with ease. No horses could be handier. 93. OXEN.

94.

JULY 28. Began to hoe the carrots of Garden field: but they are so thin, and so foul, they will never repay the labor. CARROTS.

The loss, at harvest, is but half the loss of a bad crop: it encourages weeds, and thereby injures succeeding crops. PLOWING IN BAD CROPS.

Therefore, it is good management, to plow in a straggling foul crop, *while succulent;* though it might, at harvest, be worth something: the land is *doubly* benefited, and the loss reduced to certainty.

95.

JULY 29. From the 3d of February, to the 24th of July—five months—the ox, Duke, has not had one day's ease, Sundays excepted. No horse has worked harder. OXEN.

95. OXEN. He was a little tender footed, once or twice, but presently came round again; he was as fit and free to work, the last, as the first day.

Not being very busy, turned him out, for a few days, as a reward for his past services.

96.

WOODEN HORSE COLLARS. JULY 29. This horse (See 20 JUNE) not being in constant work, I put it on the fore horse of a team.

He was presently galled about the middle of the shoulder.—I mistook the horse's as I had done the ox's shoulder.—Horses do not draw so much by the shoulder, as by the chest—the bosom:—instead of a muscular hollow about the middle of the shoulder, there is a prominent bone;—I therefore continued the bolster quite round the bosom, and hollowed it out, concave, in the middle of the shoulder, where it was before convex.

He has worked in it, tolerably well, these three weeks; but it is rather too short for him—it chafes his withers.—I hope to fit him better in a new one.

96. WOODEN HORSE COLLARS.

I am not yet clear, that wooden horse-collars are equal to straw ones; nor that wooden collars are as fit for horses, as for cattle. Horses perspire more than cattle; and, perhaps, the leather and straw collar absorbs the perspiration: but I have not yet given up wooden horse-collars.

97.

FARM MANAGEMENT.

JULY 29. The harvest is upon us, at once, and my Foreman asleep. I endeavored to rouze him, yesterday; and, today, have given him a book of memorandums of WORK TO BE DONE, to keep him awake.

Is it impossible to manage a farm with the pen? Proper orders, properly executed, must produce proper management. If the orders are injudicious, it is my own fault. But if the execution be bad, the blame falls immediately on the Ordereé, not on the laborers;—and, of course, it may be rectified by a dash of the pen. But this may need a *perhaps*.

98.

98.

OXEN CROOK.

AUGUST 4. Hoed the late-planted cabbages, with one ox, and the nose crook.

Caught him, in the pasture, with the crook, and led him home, by the ring. Harnessed him, and led him, at work, with the crook, by *the bit of the bridle*. He is full as handy, as a horse—and does not injure the cabbages so much, with his feet.

The double hook is every thing I could wish; it retards or accelerates—draws toward, or pushes offward, at pleasure. See PLATE III.

99.

HARVESTING WHEAT.

AUGUST 7. Two itinerants have made most slovenly work, in reaping the Six Acres. I apprehend it would pay for raking. Why were they not discharged? Because there was no other to be had.

Began to MOW the plot of wheat, in Barn Field. I want to bring this piece into the same crop, as the rest of the field; and were

it to be reaped, the stubble would be in the way of the plow: beside, I embrace this circumstance, as a good plea for mowing wheat; — a favorite process; and some plea was necessary, to bring the laborers to do their best. Under this, they have exerted themselves, and have succeeded pretty well. One mows it outward—a second lays it in band—and a third rakes and binds it. 99. HARVESTING WHEAT.

100.

AUGUST 7. Observing the results of some experiments, made on sowing wheat, over-plit, and under-plit. SEMINATION of WHEAT.

The experiment made in Hither Four Acres (a middle loam) the 5th November, is decisive. The Six Lands, plowed under, are obviously the worst wheat in the field. The Two Lands, harrowed twice in a place, obviously the best of these six.— The Four left rough, as the plow left them, as obviously the worst.

A fairer experiment could not be made: the preceding crop of beans was exceedingly

100. SEMINATION of WHEAT.

even; and the soil process exactly alike, throughout the field.

But this experiment was on a bean stubble; which, though clean and in fine tilth, was only once plowed: not on a fine *loose* fallow; which may require further experiment.

101.

RATS.

AUGUST 9. Clearing the barns and killing rats.

Killed upwards of thirty; and the thrashers, within these few days, have killed near forty more.

A remarkable circumstance happened: when they found themselves beset on all sides, and their strong holds broken down, a march was sounded; and a large body of them, taking the opportunity, while the thrashers were out of the barn, sallied out, in search of a more peaceful habitation. But, by mere accident, they were intercepted; and fifteen or twenty of them put to the prong.

Surely, the destruction of rats, on the eve of harvest, is a *business* which ought, every

year, to be strickly adhered to; for what would have been the consequence, had these sixty rats escaped, and increased till next summer? Fifty of them, at least, were full-grown, breeding rats! Nay, even the twenty, which the rat-catcher ferreted out today, would have stocked the premises. 101. RATS.

In future,—employ a rat-killer, even on suspicion. If he kills none, pay him for his trouble. They have eaten many bushels, perhaps some quarters, of wheat, and other corn, this year.* BARN MAN:

102.

AUGUST 9. See the 7th. I made a calculation, the first day, of the cost; and it was about 5*s*. an acre. The crop was thin, but could not have been let to *reap*, under 7*s*. 6*d*. or 8*s*. an acre;—and I think we have not a reaped field, which has not double the waste of this in it. Here, every ear is seen; — thousands are hid among the stubble of reaped wheat, which do not appear MOWING WHEAT.

* See the DISTRICT of MAIDSTONE, on destroying this species of vermin.

102. MOWING WHEAT. to the eye. The greatest objection seems to be the straggling ears, in the tails of the sheaves; which, in case of wet weather, by being in contact with the ground, would soon grow: and another, in this situation, the straw cannot be made up so neatly, for market. The comparative advantages are dispatch, in case of hurry,—cheapness,—an increase of straw,—and the soil's being freed from stubble, without the expence of cutting it.

JULY, 1777. If hands are scarce,—the crop thin, and stand fair,—the weather fine,—and the straw is not intended for market,—mowing wheat may be very eligible. The Writer, however, has not since mowed any: straw has lately borne the estimable price of £3. a ton.

103.

POTATOES. AUGUST 11. The 29th June, I planted rows of cabbages, in the intervals of a piece of potatoes.

But, though the intervals were more than three feet wide, the halm is become so luxu-

riant, that the cabbages do not thrive, and are in danger of being smothered. 103.

BAGES.

Observing this, the other evening, and regretting, at the same time, that so much succulent herbage should be suffered to rot where it grows; I broke off some of the stems, and threw them before the cows. They readily ate them.

POTATOE HALM.

This being a wet day, I set a man to work, with a sickle, to cut some of it, to try if the cows would eat it, in quantity; and likewise to try its effect on the roots.

The first has been decided:—They presently ate, as much as a man could wheel in a large barrow; leaving only the woody parts of the stems. Threw these to the hogs:—They readily ate, or sucked them. The refuse inconsiderable.

If the cows still continue to eat the halm, and the roots suffer no bad effect, what a saving! For though the potatoes were planted wide, there is herbage equal to a middling crop of tares; beside the surface being left open, for the cabbages.

Two laborers have just brought home an armfull, each, and thrown them to the hogs. They are devouring them most

103. greedily: they do not chew them for their
POTATOE HALM. sap, as they do tares and clover; but eat stems, of half an inch diameter.

104.

SOOT. AUGUST 12. Observing the result of the experiments with soot, in G. 2.—I. 1. and I. 2.—I find that which was washed in, with a shower, before the drought set in, has been obviously of service. But where it lay on the surface, till almost harvest, without rain, there does not appear any benefit. This is very obvious, in I. 2. part of which fell under the first, part under the latter circumstance.

105.

SUB-PLOW. AUGUST 16. A land of early sown turneps, in Garden field, missed; the soil of course was over-run with weeds:—gravel bind (*polyganum aviculare*) was predominant.—Put one horse to the sub-plow. (See MIN: 130.)

Sub-plowed, Raked off the 105.
Harrowed, weeds; SUB-PLOWING
Carried off the weeds; Turn-plowed,
Sub-plowed, deeper, Harrowed,
Harrowed, Rolled.

These several operations were performed by one man, one boy, and one horse, in three hours. Ten men could not have made it (about sixteen rods) so clean, fine, round, and firm, so fit for planting cabbages and colewort on, in the same time. Nothing can equal sub-plowing, for clearing the surface, from trailing weeds.

106.

AUGUST 17. The tares being all eaten, turned the oxen into some second crop of clover, last Thursday—a week ago;—but, to prevent their being blown with it, let them first fill themselves, on the meadow aftergrass of an adjoining field; and, for the first day or two, kept them stirring, on their being put into the clover. SUFFLATION.

While these precautions were taken, all was well; but last night, the carters care- HAZARD of FARMING

106. WORKING CATTLE. lessly turned them, hungry from the plow, immediately into the clover.—This morning one of them lies dead.

It seems a little extraordinary, that a field of only six acres, after having been eaten down, near a week, with from four to eight oxen, and, some days, with four or five horses, should now have this effect. Nothing, perhaps, but *turning them in hungry* can account for it.

107.

POTATOE HALM. AUGUST 18. See the 11th. Though the cows have not had the halm, regularly, nor in great quantities, the increase of milk is very sensible;—the milk too, is rich,—the butter remarkably sweet,—and the cows seem to increase in their affection for the halm.

This process, though stumbled upon, appears very eligible. The whole soil receives a perfect fallow; for the intervals of the potatoes are tilled, before the cabbages are planted; and the intervals of the cabbages, after the potatoes are taken up. The soil gives four crops: the halm, the potatoes,

the cabbages, the sprouts. The halm nur- 107.
tures the infant plants, and smothers the POTATOE
running weeds. I see but one plant, out HALM.
of a thousand, which has missed! Many of those planted, alone, in fresh-tilled earth, failed.

There is nothing to fear, but the damaging of the roots;—and I have left a plot uncut, by way of experiment.

108.

AUGUST 21. Last October, I made an TARES.
experiment, on the quantity of seed tares; by sowing one land of H. 1. twice as thick as the rest of the field; which had about two bushels and a half, an acre. The result is, the part which had five bushels is rather, but not obviously, better than the rest.

Another experiment I made, on sowing under and over the plit, of a barley stubble. The land sown under looked unpromising, during winter, and in spring,—when it was harrowed; but it is, now, on a par with the rest of the field—a very good crop. The

108. TARES. seed was plowed in, very shallow, when the soil was as loose as a garden.

In future, however,—sow, over-plit, the usual quantity of two bushels of tares, and half a bushel of supporters, of any kind that is *strong* and *succulent*.

109.

SEED WHEAT. AUGUST 21. In the spring of 1774, I sowed, experimentally, part of a barley field with wheat. The summer proved wet; and wheats in general were blighted; but this plot in particular: the straw was as black as bean halm, and the grain as light as chaff.—It appeared to be merely a slough of bran, without flour to fill out its wrinkles.

Last autumn,—after having found, by a few grains, that it was vegetative, I made several experiments, on a larger scale; and, today, I have been attending to their results.

Through the several experiments, I can find no obvious difference, between the crops produced, from this worthless rub-

bish, and those raised from wheat worth 7*s.* 6*d.* a bushel; except in I. 1. where that from the blighted seed is obviously inferior. This, however, does not prove that sowing blighted wheat is wholly ineligible; as it may only show, that a change of seed is favorable to the crop; for the rubbish in question was produced in the adjoining field (an identical soil) to the field above mentioned;—and I am by no means convinced, that sowing light wheat, *in autumn*, is bad management. 109. SEED WHEAT

But the same wheat sown, *in spring*, never vegetated. It was sown among summer tares, in three separate fields; but not a blade from it appeared.

110.

AUGUST 21. See the 12th. Observing the rows, off which the halm had been cut, the dry surface, I perceived, was mottled with wet spots. On examining farther, I discovered that each dot was centered, by a stump of halm. On touching these, I found they were covered with *vegetable blood*, which had followed the amputation. One POTATOE HALM.

110. whose top was pendent, had probably dis-
POTATOE HALM. charged a table spoonful; for it had completely wetted a spot, as large as the palm of the hand.

111.

PLOWING IN HERBAGE AUGUST 22. Begun to plow in the turneps, for wheat, in C. 1. (See 1 JULY). There are many turneps, but more charlock; which is two feet high, and difficult to be plowed under.

Hung a heavy timber chain round the beam of the plow—before the coulter; so as to drag down the weeds, and tuck them in, under the plit. It answers the purpose very well; without rolling, or other preparation.

112.

POTATOE HALM. AUGUST 23. See the 21st. The pendent stem still bleeds profusely. I timed its dropping.—It drops once in two minutes—30 tmes in an hour—720 in 24 hours. It has been cut five days. It has therefore discharged, at that rate, 3600 drops, and still continues the ejection; and, from the same

roots, there are two other branches, though this is the main stem. 112.

I observe, in general, that the higher they are cut—(the more branches and leaves there are left) the less they bleed. It is only the bare stumps that do it very perceptibly; and these, I see, bleed themselves to death. The liquor is limpid, soft, and somewhat brackish. VEGETABLE ECONOMY

24. This morning, there is a table spoonful, in a cabbage leaf, which I placed last night to catch it, and it still continues dropping.

25. This evening the stump is dry. It was cut the 17th or 18th; and has therefore bled about seven days.

It will be curious, at least, to calculate the quantity of fluid ejected, during the seven days of evacuation; and therefrom to draw the quantity of element, conveyed to the atmosphere, by the vegetable world; for, perhaps, had not the halm been amputated—had the vegetable been left entire—the same, or nearly the same, quantity of moisture would have been exhaled, in imperceptible perspiration.* ATMOSPHERE.

* JANUARY, 1799. This, however, is assuming

112. ATMOSPHERE. If this stump ejected an equal number of drops, each day, it discharged 5040 drops, in seven days. In physic, 16 drops are a drachm—8 drachms, an ounce—16 ounces a pint: therefore, from one stem were ejected, in one week, two pints and a half of element.

These potatoes were planted in rows, three feet asunder; and the plants, a foot apart in the rows: therefore, an acre of these potatoes contains 14,520 roots. Supposing that each root (or bunch of roots) furnishes two stems, there are in an acre of such potatoes 29,040 stems.

Therefore,—an acre of potatoes conveys, from the earth to the atmosphere, daily, 10,371 pints, or five tons of element.

In another point of view,—if one stem perspire $2\frac{1}{2}$ pints, and every three square feet contain two stems, every foot square furnishes 48 cubical inches, weekly.

Therefore,—a field of potatoes, in full halm, exudes, weekly, a sheet of water,

what requires to be proved. Nevertheless, I let this calculation stand. The fact may have its use;—independent of the inference.

equal to its own superficies, and one third of an inch in thickness. 112.

113.

AUGUST 30. Part of the tares of H. 1, were harrowed, in the spring; and I recollect that each side (the parts left unharrowed) was free from a species of weed, which half smothered the rest of the field. HARROWING CROPS.

Harrowing wheat, in spring, is also "allowed," to bring charlock and poppies: indeed, I have frequently observed, that wherever the ground happens to be broken, in spring, wild mustard soon appears; though the rest of the field be free from it.

Perhaps, it is, generally, bad management to harrow winter crops, in spring; except the soil be hide bound; or to remove some particular obstruction.

114.

SEPTEMBER 4. Yesterday, a great quantity of rain fell: the roads were sheets of mud. But, on riding over some fallows, DEEP PLOWING.

114. DEEP PLOWING. which lie, at present, as flat as a bowling green, I was surprised to find them still firm.

The cause did not occur, until I recollected, that these fields were plowed, remarkably deep; and, perhaps, their present firmness is owing to the quantity of cultivated mold, —to the deepness of plowing. For had there been but half the depth of porous soil, it perhaps would have been saturated, and the mold reduced to mortar.

Is not this a strong evidence, in favor of plowing wet soils deep? Instead of the superfluous moisture being checked, by the subsurface, in the immediate region of the feeding fibres, it is suffered, by the porosity of the cultivated soil, to drain away beneath them, and leave a sufficient quantity of vegetative mold, still dry enough, for the purpose of vegetation. For though the roots of corn *may* strike two or three feet deep; this, perhaps, is no reason why six inches is insufficient to bring, even wheat, to perfection.

Therefore, perhaps, on wet land, it is prudent, not only to prepare a sufficiency of soil, for the nourishment of the crop,

but likewise for an occasional receptacle of superfluous moisture. 114.

115.

SEPTEMBER 4. Finished raking and picking C. 1. SEMI-CULTURE.

This field (See 22, August) was plowed in sevenbout lands, which, I find, are too wide to be laid up, round, from a level; for, though these were plowed, by a good plowman, they are hollow sided.* The harrows, too, pulled up some of the weeds, which were not sufficiently buried; and the field had an uncouth appearance; notwithstanding the plow and harrow had done their utmost.

By opening the interfurrows (which by cross-harrowing had been filled with clods) with the double plow, a ridge of clods stood aukwardly, on each side of them, and assisted in making the ribs of the lands still flatter.

I therefore set two men with garden rakes, to rake these clods back into the hol-

* Have a flat, or hollow place, on each side of the ridge.

115. lows, and to pick off the rubbish. It has cost
SEMI-CULTURE. about 2*s*. an acre. Perhaps, 10*s*. an acre is not equivalent to the benefit which the crop may receive; for the rain water must have hung on each side of the lands, and have chilled the wheat: whereas, now, they lie dry, and tolerably round.

Had I not found, by former experience, that semi-culture—horti-agriculture—semi-gardening—gardenly agriculture—a cursory picking, hoing, or raking, is not so labor consuming, as at first sight it may appear, I should have been startled with the idea of expence. But what is the expence of 2*s*. on an acre of wheat?

It would not, perhaps, in the present state of things, be eligible to reduce each field to a garden; but I would wish to see an arable field and a kitchen garden bear some resemblance.*

WORKMEN. In agriculture, as in every other department of conduct, there is a MIDDLE WAY, difficult to be hit; and laborers, fit for gardenly agriculture, are difficult to be met with. A man brought up in the good old way

* See WEST OF ENGLAND, Art. WHEAT. Also MIDLAND COUNTIES, Head, SEMINATION.

is habitually a sloven, and incapable of instruction. One, tutored in a garden, is too tenacious of his profession, not to be too nice: an acre requires *one* day's work—the former *cannot* perform it,—and the latter *will not*, in less than *two*. 115. WORKMEN.

116.

SEPTEMBER 7. From the pea rakings, weeds, and rubbish, brought home, and strowed in the fore part of the farm yard,—to be trodden by the passing and repassing of the cattle, hogs, and horses.—carried out seven or eight loads of *dung*; as much as will, in a very little time, make five or six loads of good manure. Surely, this is better than burning them. FARM YARD MAN:

Brought in some couch, and other weeds, to re-place them with. It is scarcely possible, that either root or seed can remain vegetative, after being incessantly trodden, sometimes wet and sometimes dry, for a month or six weeks, in the yard, and after being piled and composted in a mixen.

117.

BUSINESS of HARVEST. SEPTEMBER 7. Provoking! Yesterday, we turned all the barley that was mown, and, by ten o'clock this morning, it was in tolerable order. Got twenty hands to work; —the whole was ready;—but before the fourth load was in the stack, and the fifth loaded, the rain set in, almost heavy enough to float it in the field.

118.

CUTTING POTATOE HALM. SEPTEMBER 12. See MIN: 107. Made a fair test of the effect on the roots. Took up two rows of equal length—the halm of one cut,—of the other, uncut: the uncut are obviously the best. The number of roots, no doubt, are the same; but the quantity is nearly double. The roots of these large and fine; of those, small, and probably have not waxed, since the halm was cut;—but they do not appear shrivelled.

But does not the gain of the halm more

than balance the loss in the roots? It is understood, that, when the halm begins to change its color, the potatoes have done growing. And, 118. CUTTING POTATOE HALM.

Perhaps, in future,—Cut the halm, when the roots are large, but before the tops have lost their succulence.

119.

SEPTEMBER 13. At noon, unharnessed the oxen, and turned them into the ley fields, where they had been at plow. They have constantly, for this week or ten days, been taken off, about this time of the day; and the carter and plowman gone to making hay, —turning or carrying barley,—until dark. WORKING CATTLE.

This is a great advantage of cattle: horses must have attendance, work or play. A boy turns out the oxen, and they are done with.

120.

SEPTEMBER 14. The second cut of clover, over all the country, except that cut very STRAW HAY.

120. STRAW HAY. early, is totally lost. Ours had been mere dung, by this time, had we not carried it in a grassy state, and mixed it with some oat straw, saved for the purpose. Notwithstanding there is as much straw as hay, it was so full of sap, the stack now smokes like a chimney. The straw is sopped with the juices of the hay; and, if it does not fire, it *must* be excellent fodder.

This is certainly an eligible plan of management. It is drawn from last year's experience, and observation. It is convenient to save a stack of oats, until summer (See 22. Nov. 1774); and the second cut of clover is, at best, precarious. By this management, the straw is converted into hay (the cows eat the little which I mixed, last year, as greedily as they did middling hay), and the clover, in case of dripping weather, is saved from the dunghill.

121.

TIME of SOWING. SEPTEMBER 18. Early sowing has many advantages. The crop is got off, while the days are long: the *chance* of being caught

in the autumnal rains is *lessened*: and the crop is not so liable to the devastations of domestic animals, of every species, as straggling late crops are. 121. TIME of SOWING.

At this time of the year, stock of all kinds are abroad. It is convenient for people who have nothing out, to take it for granted that all is in, and their care, of course, at an end. It is, therefore, next to an impossibility to preserve backward, straggling crops.

122.

SEPTEMBER 20. There is a right way and a wrong, in doing every thing: barley may be turned, well or ill. The heads of rakes, and the tines of forks, are improper. The handles of either, or any other long stick, is much better. Those break the swaths; these preserve them more entire, and lay them much lighter. But a CORN FORK, especially without the *thumb*, is the best; for, be the swaths ever so much broken, this turns them clean, and lays them light. TURNING BARLEY.

123.

123.

PLOWING. SEPTEMBER 21. F. 2. was laid in high round ridges, for wheat; and I wanted to keep it still high, and dry, for tares, on one plowing. How was this to be done? To have gathered upon the same lands, would have laid it too high;—to have gathered in the interfurrows, would have laid it too flat; nor could two of them have been laid sufficiently round in one; and, consequently, the trough, left in the middle, would have been filled with water, during winter.

I hit upon this method:—I plowed them in double lands; but instead of filling up the old interfurrow, with the first pair of plits, I dropt them short of it, leaving the old furrow quite open. This pair I plowed fleet, the next three or four deep, and the outsides of the lands, as fleet as possible.

Thus it lies almost in the same lands—sufficiently round—and drier, for tares, than for wheat.*

* On wet, *flat* land, every expedient, to keep winter crops out of the water's way, is valuable; and, when

124.

SEPTEMBER 25. (Monday) During the late rainy weather, I made these observations. WEATHER.

The SUN never set clear, except one night, and the next day was fine. Last Wednesday evening, he was lucid, till within a few minutes of setting, when he seemed to descend behind a dusky mountain: it lightened much in the night; and, next morning, thundered and rained a good deal. On Thursday, he set among broken clouds; but, whenever he appeared, it was with a vividness which showed the transparency of the atmosphere: he did not, as before, seem to immerge in an ocean of vapor. We have had remarkably fine days, ever since.

It is a received opinion, that the weather is influenced by the MOON;—and whether or not "Saturday's moons" are generally worse than others, the late moon certainly changed on a Saturday. She changed, again, last

the soil has been laid up very high, for the preceding crop, the above method is eligible. JAN. 99.

124. night, the weather, therefore, changed two
WEA- days before the moon.
THER.

The WIND was chiefly to the westward, and generally high. It once got round to the eastward, and stood for some time; but without any change in the weather.

The atmosphere was seldom free from large towering CLOUDS—some vertical, some oblique, but few horizontal. On Monday, and Tuesday, they became less unwieldy; they seemed to weave themselves into webs of vapor, which flew across the field of view, with great rapidity; sometimes bending towards the earth; giving drizzling showers.

Until Wednesday evening, I do not recollect seeing a COBWEB UPON THE GROUND, for the month preceding. Some barley, which was then spread in the field, to dry, was covered in a few minutes. Before sunset, the whole earth was completely strowed with the filaments of spiders. They have continued, since, to spin out their threads so profusely, that they float in the air, in ropes; and, by coming frequently across the face, make it disagreeable to ride through the fields; and more especially through close woody lanes.

GEESE, during the intervals of sun and wind, repeatedly washed themselves, with a glee which seemed to intimate an agreeable expectation, and generally preceded heavy showers. 124 WEATHER.

The RED BREASTS whistled faintly, *under* the sheds, and *in* the hovels, till Friday morning; when they sung aloud, *upon* the barns and offices; appearing to proclaim the agreeable change.

FLIES were troublesome, but not very remarkably: yet, I could frequently guess, by the uneasiness of my horse, the quantity of rain which was coming.

The BAROMETER was fluctuating and unsteady; but generally portended the rain, pretty truly.

Nothing, however, marked the change, so discriminately, as the SPIDER.

125.

SEPTEMBER 28. Began to mow barley for hay. (See MIN: 79.) BARLEY HERBAGE

That which did not vegetate, till after the drought, is still green as grass; with the

125. milky grains thin and puny; and winter at hand. The tares, which were sown among a part of it, are now in bloom, and very luxuriant; and, should the herbage be well got, perhaps, it will pay nearly as well (this year of scarcity) in *hay*, as if it had ripened in time for *corn*.—Where the tares were sown, there is from a load and a half to two loads, an acre. The scattered plants, which came up, at the time of sowing, are now very fine barley.

BARLEY HERBAGE

126.

SHEEP. RAPE. TURNEPS.

OCTOBER 5. Part of B. 3. a fallow for wheat, was sown the 25th July, with turnep seed,—part with rape seed. A hundred sheep were turned in, the latter end of September. They ate the rape down to the clods, before they touched a turnep (or rather turnep tops). After they had been in, a few days, one side of the field looked like a fallow, the other like turneps untouched.

127.

SEMINATION.

OCTOBER 5. There are two or three advantages arise from sowing, immediately after the plow:—The surface lies light and porous;—the seeds drop into the little cells and crevices, left by the operation, and are effectually covered. It is observable, that the corn sooner appears, in this case, than when it is sown over the stale plit. But, perhaps, the greatest advantage is this:—*The corn starts with the weeds.* Whereas, when it is not sown, immediately after the plow, the weeds have sprouted, and are ready to break the surface, before the corn has had an opportunity to vegetate; and thereby gain an advantage, which they never after lose.

128.

CHANGING SERVANTS.

OCTOBER 10. What an absurd custom, to change servants at MICHAELMAS: the very height of wheat seedtime!—Instead of four, I can make only two tolerable plow-

128. men. What a shame, that a week of fine weather should be lost, at this critical time of the year!

CHANGING SERVANTS.

How much better the custom of the North of England, where MARTINMAS (the 22d November) is the only time of changing servants. A more eligible time could not be devised, by the farmer. The strangers enter in a scene of tranquillity, and have all the winter to become familiar in;—while, here, they are lost, in the bustle of wheat seedtime; wholly ignorant of the field they are to hurry to, and of the brute and implement they are to work with.

129.

HAZARD of FARMING

OCTOBER 10. Although my mind is more at ease, tonight, than it has been since the late rainy weather set in; yet I cannot suppress my astonishment, that not one writer on Agriculture has touched on the HAZARD OF FARMING. They suppose the crop in the barn, before it is cut;—and calculate the quantity of produce according to the state

of the soil; without taking in the idea of the uncertainty of seasons. 129. HAZARD of FARMING

But how ignorant! my barley, this year, including the loss of fodder and extra labor, is at least 25 percent, worse, for the weather at harvest, and 20 percent, more, for the drought after seedtime. One neighbouring farmer turned his hogs to his barley, and another's was scarcely worth carrying home. I had some second cut of clover offered me. I calculated *the hazard of a late crop*, and would not give the price demanded. It was sold, cut, and cooked; but rotted in the field; and was left as manure for a future crop.

Insurers have averages, Merchants bad debts, and Farmers bad weather.

130.

OCTOBER 10. Sub-plowing N. 4. SUB-PLOWS.

SUB-PLOWING (cutting the roots of weeds, under-ground, and at the same time loosening the soil, *without turning it*) is a favorite operation. I have long conceived its utility, but could not find an implement, which

130. SUB-PLOWS. would work, wet or dry, foul or clean. The *Thanet shim* (used in horse-hoing) is a fair-weather, clean-soil, implement:—the *half-moon horse-hoe* (which I contrived, and have used some time) does its work, tolerably well, where the surface is not too foul; but it is apt to choke up, between the coulters; and does not sufficiently clear its share.

JULY 1777. The Writer apprehends, that a common plow, with a *very wide share*, and *no mold board*, is the most eligible subplow, for general use.

JANUARY 1799. I was not aware of the practice of the DISTRICT of MAIDSTONE, when I used this operation. See the SOUTHERN COUNTIES. Sect: 7.

131.

CHANGING SERVANTS. OCTOBER 12. What a vile custom, to change servants, at Michaelmas! All is hurry and confusion; and nothing done. Teams standing idle, while the seed lies on the surface, for want of harrowing in;—and such a day as we cannot expect, again, before next spring! How easy would it be to transfer it to Martinmas!

132.

YIELD of WHEAT.

OCTOBER 14. Last year, we made a bushel of tail, to every fifteen bushels of head: This year, to eightyfour bushels of head, we have but one bushel of tail. Last year, the tail was all bran: this year, full of flour. Such is the difference between a bad and a good wheat year.

133.

SUB-PLOWING

OCTOBER 20. Landing up the upper part of M. 1.

This soil has not been *turned*, since it was plowed, for peas, last spring. No garden can be *finer*;—it is a pleasure to see it break up. It was sub-plowed with two oxen;—harrowed—rolled—raked, and the weeds burnt, once. The lower part of the same field was turned with four oxen—harrowed—rolled—raked, and burnt, thrice. This cost £2. 9*s*. That but 12*s*. 10*d*. an acre.*

* But see MINUTE 233.

133. When once the surface weeds are turned in, there is no end to the labor of getting them out again:—but, taken while on the surface, they are easily got rid of.

SUB-PLOWING

134.

FARM MANAGEMENT.

OCTOBER 29. See 29 July.—"Can a farm be managed with the pen?" No,—nor with twenty tongues, without self-attendance, or a brisker Ordereé than I have, at present.

To manage a large, scattered farm, with any degree of propriety, requires an attention, and alertness, which scarcely anything, but self interest, can give.

The principal object, (in the executive department) is to keep the teams and daysmen employed,—to see that neither of them stand idle, for want of orders. And this, if they are numerous, and much broken work in hand, requires a great deal of assiduity and attention. The nearer they are kept together, the more easily they are managed.

When dispatch is particularly necessary, somebody must be, or *seem* to be, in a hurry.

—Somebody must set the example:—some- 134.
body must call, or all hands will sleep on.

A *mere bustler* should think of nothing, FOREMAN
but forwarding the work before him. He should have no concern of his own:—no wife and family, to alienate his attention. His interest should be interwoven with that of his employer. He should be active, austere, and communicative: many things occur in conversation, which, without it, would remain latent. One in the house is worth two at a distance:—twenty little requisites are seen and forgot, for want of immediate communication. He should be ever at home, that the attention of his leisure hours may be employed, on his next day's duty.

135.

OCTOBER 20. There is not one plowman, PLOWING.
in twenty, that can lay up land, well; not one in fifty, neatly. They begin and end, with the plits too deep. This, instead of laying the ribs of the lands convex, leaves them hollow.

Good plowing requires much practice,—

135. PLOWING. *neat* plowing a great deal:—the first step is to plow a *clean* furrow,—the next, a *straight* furrow,—the next, to *land up well*,—the last, to *land up neatly*.

136.

COURSE of PRACTICE. OCTOBER 23. Last Thursday night, Friday morning, and yesterday, there fell so much rain, that we can neither plow for wheat, nor harrow it in. Neighbour —— has yet sown but a few acres of wheat:—he cannot get upon his fallows.

WHEAT, on CLOVER LEY. How many advantages arise, from sowing wheat, on a CLOVER LEY; especially, in a wet country! The dung is got on, at leisure. The roots and seeds of weeds, the grubs and insects it contains, perish on the surface. The manure is impartially imbibed—equally incorporated with the plant-feeding stratum;—not buried, in a rough, porous fallow, in large cakes, fraught with animal and vegetable weeds;—nor too deep, so as to escape beneath the influence of the sun: nor carried on, when the teams ought to be plowing for, and harrowing in, the seed.

I have not a neighbour, who did not waste the late fine weather, in getting on his manure. The wet is now set in; and, should it continue, many of them must inevitably lose their wheat seedtime. 136. WHEAT on CLOVER LEY.

But what strikes most, at present, a crossfurrowed clover ley, on the wettest soil, may be plowed, sowed, and harrowed, in halfrod lands, be the season ever so wet.

137.

OCTOBER 24. If land be laid up well, in halfrod ridges, opening the interfurrows is, perhaps, unnecessary, is perhaps pernicious. If they lie on a moderate acclivity, and have a deep crossfurrow, drained by a good ditch, there is no fear of water standing, in the interfurrows, for want of opening. OPENING INTER FURROWS

Those of the wheat, at Woodside, are strowed with clods, of all sizes: the soil harrowed very rough, and the largest, of course, rolled into the interfurrows: yet, during the late rain, there has not a drop of water stood in them.

The rain which falls on narrow ridges

137. does not, where the descent is *moderate* form a *current*, in each furrow; but steals away, gently, among the clods; till it creeps into the crossfurrow. To remove them is therefore unnecessary. But these clods, by remaining, may stop the flight of many vegetative particles,—may act as a filter:—to remove them may therefore be pernicious.*

OPENING INTER FURROWS

138.

BEASTS of DRAFT.

OCTOBER 25. This morning, put four HORSES to the rough round harrows, with the fine flat ones, hung one on either side, to harrow in the wheat, on the rod-wide beds of Barn field. The land is so very wet, it is impossible to get *upon* it:—the *horses* cannot draw, even in the interfurrows; and had it not been for the OXEN, I do not see how it is possible, that we could

* This does not hold good, where the land lies nearly level: nor even where the descent is great; as, in this case, a *current* is formed: the loose soil in the interfurrows is of course washed away; and the crossfurrow thereby silted up. So that, in general, it seems to be adviseable to open them.

have covered the seed, in this field, except by hand. 138. BEASTS of DRAFT.

The leg of a horse is largest at the base, and he lifts his foot, perpendicularly: he has not only the super-incumbent mud, but the super-incumbent air, to pull against. On the contrary, the leg of an ox is tapering to the toe, and he draws his feet after him; he, therefore has no weight of mud to lift, nor forms a vacuum under his foot.

139.

OCTOBER 25. Crossfurrowing H. 1. SURFACE DRAINS.

This field is such a complete level, that a good cross drain, at one end, is insufficient to draw the water out of the interfurrows.

In evidence of the necessity of crossfurrowing, the end which was laid dry, immediately after plowing, was *im*printable by the foot; — while the middles of the ridges, at the other (though the water did not stand above three inches deep) were mere mud; notwithstanding they lay twelve inches above the surface of the water. In stepping across the furrows, I sunk four or

139. five inches, and two or three, upon the tops of the ridges.

SURFACE DRAINS.

Place the bottom of a sugar loaf, in water, and this will presently reach the top: and such, doubtless, is the nature of the ridges of a sandy loam, lying on a retentive sub-soil. While any quantity of water lodges, in the furrow, the ridge is, more or less, in a state of mud.

FALLOWING.

It is observable, that, wherever the inter-furrows of the cross plowing fell, in this field, there the water stands. And, be the plowmen ever so expert, this will always be the case, in a level field, crossed with a *fixed-wrest* plow. A *turn-wrest* plow is therefore obviously preferable, for cross plowing;—such a field, especially.

140.

HARROWS

OCTOBER 27. Harrowing wheat into half-rod ridges, with the round harrows, drawn by oxen.

OXEN.

It is equally pleasurable, to see the rough ones let down the seed, and to observe the gardenly neatness of the beds, after they are

finished with the fine ones; especially when drawn by oxen, which work well, and tractably. 140, OXEN.

I have had two teams, constantly going, for two months, without interruption. They have been kept, all the time, on secondary aftergrass, and in the common fields, at a comparatively trifling expence. They have worked on the gravel of Adscomb, for near a month; yet not one favors a foot; though unshod; and they have lately been driven by two of the smallest plow boys.

141.

OCTOBER 28. I see, that, this year, we have chopped eighteen acres and a half of stubble; off which we have carried six middling loads. Eighteen acres and a half at 3*s*. (no beer) is £2. 15*s*. 6*d*.—or 9*s*. 3*d*. a load. Stubble, fit for litter, may, this year, be worth 10*s*. a load;—but there is a great difference between buying stubble, at 10*s*. a load, and paying 10*s*. a load for cutting it. STUBBLE MANURE.

142.

SUFFLATION.

OCTOBER 29. Last night, the suckler drove one of the cows out of the suckling house, into the yard, calling out, "The cow is sprung." She was swelled prodigiously, and as he ran her about, I perceived that she continued to increase in size; until she threw up a great quantity of phlegm. This seemed to ease her;—but presently the swelling increased, more than ever; her hide was a perfect drum. I conceived that salt and water would be of service. And three or four horns of strong brine were immediately poured into her. She ran out of the yard, and took a circuit, of about a minute. When she came in, I fancied that her off-side began to sink. I poured down three or four horns, more,—still keeping her quickly moving. She presently began to dung; with other obvious signs of amendment. I then gave her a little more brine, with a small quantity of black pepper in it;—keeping her gently stirring. Her barrel, now, began to sink, on the near

side, she breathed more freely, and staled and dunged, abundantly. In ten minutes, she began to chew her cud. I kept her in the house all night;—she sweat profusely;—and, this morning, she is perfectly well. 142. SUFFLATION.

On examining the matter thrown up, I found it to be phlegm and cabbage. I was at a loss for the cause, before I perceived this;—for she had not been in, nor near, any clover, or other succulent herbage. A sledge load of cabbages had been brought into the yard, for the store hogs; the cows fell greedily upon them; and this was doubtless the effect. CABBAGES.

The saving of the cow does not please me more, than the simplicity of the cure:*—it may be the saving of many. I do not attribute it, wholly, to the salt and water, nor wholly to the running; but to both. With this, alone, she grew worse: that, *perhaps*, would not have operated so quickly, without the exercise.

The dose was three or four handfuls of

* The Writer has since learnt, that this is not a new, but a well known remedy.

JAN. 1799. In the Midland Counties, water alone is given; and, in some cases, with good effect.

142. CAB-BAGES. salt, to about three pints of water. This was given the two first times; the last was the same proportion, with about half an ounce of pepper:—of this she had three or four horns.

143.

COUPLING HOGS. OCTOBER 31. The coupled hogs have gone on, remarkably well, in stubble time. They were usually turned into a field, in the morning, and fetched home, in the evening, without any other attendance. Since the stubbles have been done, they have run after the acorns. I was apprehensive of an accident; and ordered them to be kept in the yard, and to be fed with cabbages, which are spoiling.

But *there is no dependance on servants;* they were let out; no farther care taken of them; and two of the best found hung in their couples.

With respect to the use of couples, I am clear that they forward, rather than hinder, the growth of rearing hogs. They seem to contend, and drag each other about, on the road; but, while they feed, they are

perfectly peaceable. This obstinacy, off their feed, prevents their rambling, and preserves them in condition. No hogs can look better, nor can have been reared, at less expence than mine, this year; and I am by no means dissatisfied with couples: I only blame myself for letting hogs of so much value, run through the woods and hedges, with so little looking after. And for this I cannot blame myself, but the servant; and who can guard against the carelessness of servants? 143. COUPLING HOGS.

JANUARY, 1799. In open countries, as Chalky Downs, where swine are tended in herds,—perhaps, among crops still on the ground, couples would be found highly valuable. And, in well fenced inclosures, during summer, and the earlier part of harvest, young hogs, at least, may be coupled, with safety and advantage. But, in later harvest, during the fall of the acorn, swine become peculiarly ferocious, and require particular care and attention.

144.

SOWING in RAIN.

NOVEMBER 1. Yesterday morning, sowed and harrowed in wheat, while it rained hard. The ground was fresh plowed, the surface as loose as a garden, and it was likely for a rainy day.

There is, I find, a disadvantage, as well an advantage, of sowing in rain. The grain does not *roll* in the crevices, but *sticks* where it falls; and after it had been harrowed, I could see many grains uncovered; some on the very tops of the largest clods. But it proved a rainy day, and a very rainy night. This morning scarcely a grain is left uncovered. Besides, we may not perhaps, be able to work, even in the interfurrows of this field, for a fortnight to come; and, then, the seed must have been thrown over a stale, gluey surface, difficult to harrow.

And, perhaps, it is good management, to sow wheat, in a wet and *late season*, on *wet land*, while it rains, till the harrows plaster the surface.

145.

SERVANTS' BEER.

NOVEMBER 5. This rainy day, I calculated the cost of farm ale, and small beer.

From five bushels of malt, I find, are brewed, on a par, fortyfour gallons of ale, and eighty of small beer: this, reckoning the small, at four to one, is sixtyfour gallons of ale.

	£.	s.	d.
Five bushels of malt, at 5s. is	1	5	0
Three pound of hops, 1s. is	0	3	0
Brewing 2s.—fire, 1s.—wear and tear, 1s. - -	0	4	0
	£. 1	12	9
Deduct grains, 1s. yeast, 1s.	0	2	0
	£. 1	10	0
Sixtyfour gallons at 5d.¾	1	10	8

Not 6d. a gallon! not 1d.½ a quart for the ale, nor 1d.½ a gallon for small beer.

JULY, 1777. The Writer is convinced, from this calculation, that it is cheaper to give day laborers 9s. a week and small

145. SERVANTS' BEER. beer (the common wages of this country), than to give them 10*s.* and no beer. But, so many disagreeable circumstances attend giving out beer, he still continues to pay them 2*d.* a day, instead of small beer.

146.

CHANGE of SEED. NOVEMBER 5. Last year, I searched the country round, for some seed wheat, off a very poor gravel, to sow on the stiff clay of Norwood; and at last I succeeded.

The sample, however, was thin, shrivelled, and looked as beggarly as the soil it grew on. But this year, a more b autiful sample cannot be shown: its boldness and color strike every one. From eightyfour bushels of head, there was but one bushel of tail;—and this is a much better sample than the original seed! But this is a *wheat year*.*

* For observations on this material point of management, see the following EXP: and OBS: also MIDLAND COUNTIES. MIN: 91.

147.

NOVEMBER 9. I wish to hit off a simple contrivance, which will, in some degree, answer the purpose of what is called trench-plowing;—which will totally hide the sod, and give a sufficient quantity of crum,* without the additional resistance, or the complexness of the two-wheeled trenching plow. PLOWS.

The *fin coulter* does very well, where the surface is firm and clean; but, where it is loose or foul, the rubbish drives before it, and prevents its acting,

(This is an ordinary coulter, with a strong blade welded to it, a few inches from the point, so as to cut off a triangular thread of sward; which, in the turning of the plits is buried beneath it; leaving the upper edge free from roots; and, of course, easily reducible by the harrows.)

Yesterday, I *bent* a coulter, and this morning tried it. It buries the grass, and gives

* Friable mold, free from grass and roots.

147. PLOWS. a sufficiency of crum; but it increases the resistance, and unsteadies the plow.

For a wet country, nothing equals the swing plow. Wheels may be useful, in a dry *flat* field; but among narrow, high *ridges*, they are very unmanageable.

For a SWING TRENCHING PLOW, see description of IMPLEMENTS; also PLATE III.

148.

PLOWING NARROW RIDGES. NOVEMBER 9. Plowing L. 2. an oat stubble, for beans, to be dibbled in alternate seams.

BEAN CULTURE. But it is difficult, or impossible, to plow it, in neat, regular, whole plits, fit for this purpose; which, however eligible it may be, for drier land, that will bear to be laid flat, or in wide beds, so that an even plit can be uniformly carried, appears to be altogether improper, for wet lands, which require to be laid up, in narrow ridges, and in forming which plits, of uneven dimensions, are requisite to be taken.

I must, therefore, endeavor to contrive an implement, which, after the halfrod

ridges are laid round, with the concave harrows, will answer as a *marker*, and draw lines, at suitable distances, to direct the dibblers. 148. BEAN CULTURE.

11. Took out all the blades of the lance (see MIN: 90.) except three at each end, left standing, at sixteen inches apart; with the two innermost ones (to admit the interfurrow) at twentyfour inches asunder. BEAN GROOVE.

With this, and one horse, I drew *lines*, sufficiently true, and discriminate, for the intended purpose.

But this led to the idea of drawing GROOVES, (instead of lines) sufficiently deep, to receive the beans, to be dropped with one hand, and covered with the other; and I have ordered the blades to be *splayed;* to have their backs cleft open, so that they may leave grooves, or small trenches, behind them.

With four hoes, fixed in the same implement, I hope to be able to hoe the four equal intervals; keeping the interfurrows clean, by plowing, and the double row on the ridge, by hand hoing.

149.

SURFACE DRAINS.

NOVEMBER 11. I find that seventyfive acres of tares and wheat, which I have already put in, have cost thirtyfour days' work,—or £. 2 16*s*. 8*d*.—or 9*d*. an acre, for crossfurrowing.

I purposely spared no useful expence; some of the fields having two, some three furrows, across them. Wherever I found the water stand, I applied the plow and spade.

I suppressed every idea of expence, until I had made this calculation; and, I confess, I am surprised, to find it so low. However, to this is to be added the drawing of the furrows, with the plow: this cost a team, at least,—say 9*s*. 4*d*.½ or 1*d*.½ an acre.

Thus for 10*d*.½ an acre, some of the wettest land, in nature (above the level of standing water) is made dry.

Had proper plowing, and 10*d*.½ an acre, been laid out, on the Four Acres, in 1773, the crop of wheat would have been, at least, £3. an acre the better for it.

150.

LOCKS and KEYS.

NOVEMBER 17. This rainy day, I collected, and numbered, the padlocks, and their respective keys. On a slate, against each N°. wrote their several stations. Hung the slate and the keys on the same pin, in a place open to the servant: so that every one readily knows the key, which opens any door or gate about the farm.

Cut the numbers with a file.

151.

OXEN.

NOVEMBER 17. On Wednesday, the ox and the horse teams, four in each, were plowing together, in K. 4. It came up very tough:—the horses fretted, and were bathed in sweat;—while the oxen chewed their cuds:—a proof that they worked at their ease.

152.

MANURE. NOVEMBER 18. I am adjusting the first year's accounts; and wish to ascertain the profit, or loss, on each crop; but I am baffled with the *manurings*:—I am at a loss to know how much to charge, for the EXPENDITURE of VEGETABLE FOOD, on a crop of wheat, beans, or barley.

This rainy weather, I have been searching for a general rule; and have found one, which, at present, pleases me, much.

ACCOUNTS. To five shillings, for every field load of corn, or pulse, add fifteen, for every quarter of wheat, and five, for every quarter of any other grain;—and allow for every ton of hay, whether meadow, ley grass, clover, or tares, ten shillings.

I have tried it on the round of fallow crop,—spring corn,—clover,—wheat; and it answers sufficiently.

I would not wish to lay less, nor more, than twenty jags (about thirteen or fourteen full loads) of strong compost, an acre, on the spring corn stubbles; and I should

expect from middling land, on a par of 152.
years, ACCOUNTS.

The first Year:

	£.	s.	d.
One ton and a half of clover, the first cutting, and three quarters of a ton, the second -	1	2	6

The second Year:

One harvest load and a quarter of wheat, yielding $2\frac{3}{4}$ quarters of grain - -	2	7	6

The third Year:

One load of peas, or beans, yielding 2 quarters - -	0	15	0

The last:

One load and a half of oats, or barley, yielding $3\frac{1}{2}$ quarters -	1	5	0
	£. 5	10	0

Twenty jags, at 5*s*. 6*d*. a jag (including labor) is - £. 5 10 0

JULY, 1777. This is, by no means, laid down as a certain rule: the price of dung, and the crop for which it is put on;—the price of labor, and the *quality of the soil*;

152. —will ever make it various. It is the *pro-*
ACCOUNTS. *blem*, rather than the *rule*, which is meant to be published. It opens a wide field, for experiments, on this subject.

The mathematics cannot produce more positive facts, than these:—VEGETABLES EXHAUST THE SOIL ON WHICH THEY GROW;—DUNG REPLENISHES IT. But the quantity of *inhaustion*, equivalent to a certain quantity of *exhaustion*, is a matter, which has not, I believe, been attended to.

153.

OXEN and HORSES. NOVEMBER 22. This being a cold frosty evening, and the grass almost done, took up the oxen, for the winter.

They were turned out, to aftergrass, the beginning of August. Until a little before Michaelmas, they worked constantly, without any other food. Since then, they have had a little hay, night and morning; but the whole have not eaten thirty trusses.

It is impossible to calculate their expence, with certainty, because they were generally mixed with other stock; but suppose one

team eat twelve acres (which they did not) 158.
at 10*s*. 6*d*. - - 6 6 0 OXEN and HORSES.
And twentyfour trusses of hay,
at 50*s*. - - - 1 13 4

£. 7 19 4

From the beginning of August, till now, is near four months. One of the horse teams has cost, from 25 to £30. during the same time;—at least, three times as much: as appears by the following account.

During the last fifteen days, five cart horses have eaten twentyseven trusses of hay; that is, about CART HORSE HAY.

Ten trusses, a team, a week,	£.	*s*.	*d*.
at 50*s*. - - -	0	14	0
Six bushels of oats, at 24*s*.	0	18	0
Say for chaff - -	0	4	0
	£. 1	16	0

Six shillings each working day, rainy days included.

TO REDUCE, in future, the expenditure of hay, to a certainty, I have *allowanced* them, with hay, as well as with corn: I allow each horse a bushel and a half of oats and one truss of hay, a week, with as much

153. chaff as they will eat. The hay is meant, merely, to rack up with; to eat in the night while the carter is asleep.

154.

HARROWING. NOVEMBER 23. Yesterday afternoon, the frost began to abate. I embraced the opportunity to fine harrow K. 4. but it was still too hard:—the harrows had not gone ten yards, before one of the tines tore its way out of the beam.

SOILS. This morning, the frost is entirely gone. Tried it again. The surface is now perfect birdlime;—it will not part from the harrows;—the man and horses working, up to their knees, in dirt. O! the effects of farming, in a dirty country,—without the assistance of clover leys.

WHEAT. Neighbour —— has now a large field of dunged summer fallow, lying in a state of absolute mortar;—and neighbour —— not much better.

155.

NOVEMBER 23. See 14 Sept. Though it took a very fine heat, it cuts out white, and dusty. It had too much "water wet" in it;—the sap was not powerful enough, to drive it out; but it was sufficient, to make the straw brown, as a nut. STRAW HAY.

In future,—if possible, mix it perfectly full of sap, but perfectly free from water wet.

However, mouldy as it is, the cows eat it, greedily; but the dust seems to be troublesome to them. Today, took a load of it to the barn, and thrashed it. This breaks the cakes, and rids it from a great part of the dust.

NOVEMBER 27. The cows could not eat the best meadow hay, with more avidity, than they do that which is thrashed. They do not waste a straw of it. MOULDY HAY.

Gave some of it to the oxen. I think they eat it, as greedily, and as clean, as they do very good clover-and-raygrass hay. There is no obvious difference.

In future, — let nothing, but absolute

155. STRAW HAY. necessity, prevent me from collecting, at least, twenty load of straw hay. It is converting 15*s.* worth of *straw*, into 50*s.* of *hay*; besides, perhaps, saving the second cut of clover from the dunghill.

156.

SHOEING OXEN. NOVEMBER 27. It is very observable, that while the oxen worked, on a sharp gravel, in the midst of a hot, burning summer, their feet stood exceedingly well; but, now, when they work, in a wet country, in wet weather, they are become tender; and a frost, or a gravelly road, is death to them. Their forefeet are worn to the quick.

As, in case of frosts, we shall want them at the dung cart, shod them, *before*.

This was done, *without casting them*. A man held the ox, by the ring, while a boy suspended the foot, by a rope thrown across a cart-saddle.

157.

157.

DECEMBER 5. When halfrod beds have been laid up, sufficiently high for a winter crop, as wheat, it is difficult to reverse them (to raise a ridge over the old interfurrow, and leave a new interfurrow, under the line, of the old ridge) so as to lay them, again, sufficiently round, and with interfurrows sufficiently deep, for another winter, or early spring crop; as beans, &c. Nevertheless, if the old beds do not lie *very* high, (see MIN: 123.) it is in the power of the plow to do it; and may be thus effected. PLOWING NARROW RIDGES.

The first plit plow, about five inches thick, and drop it into the old interfurrow;* the second—seven or eight inches thick, burying the first, without suffering the second to fall over, into the first made plowfurrow;† the third, — nine or ten inches, hiding the *mane* of the second, and

* The thickness of the first plit ought to be regulated, by the depth of the old interfurrow.

† The crest of this plit forms the middle or crown of the land.

157. PLOWING NARROW RIDGES. forming a seed-seam, between the crests of the second and third; the fourth, fifth, sixth, and seventh—nine or ten inches square, with a heel-plate, fixed about six inches above the wrest of the plow;* the eighth and ninth—seven or eight inches thick, and ten or eleven wide, or according to the width of the land. The ninth is the last plit of the *first* land; but every succeeding land has a tenth—a subsoil plit—a "crum furrow" —which forms the new interfurrow; this is fetcht up, four or five inches, below the bottom of the outside plowfurrow of the preceding land, leaving a handsbreath between the edge of the interfurrow, and the outside plit; as a footing to the latter, to prevent its being torn into the former, by the harrow.

JULY 1777. The plowman who can make and reverse halfrod beds, with propriety and neatness (these are hardly separable) is invaluable, on a wet retentive soil; for there is not one in ten, not one in twenty, equal to the task.

* Plowing the inside plits, with a wide-sterned plow, and the outsides with one comparatively narrow behind, is of essential service, in raising the crowns, as will be shown in MIN: 251.

The Writer does not wish to see, even wet land, laid up in sharp ridges; but he would always have the crown some inches higher than the skirts;—the face of the land forming an arch of a *large* circle: and, at the same time, to see the interfurrows, formed out of the subsoil, some inches below the subsurface. For, be the beds ever so truly convex, they will, during rain, absorb a greater quantity of water, than is necessary for the purposes of vegetation; and, if the interfurrows are not deeper than the plow-furrows, the plits must be bedded in mud, during winter, and the roots of the corn be consequently chilled. On the contrary, if the interfurrows are lower than the subsurface, the superfluous water has always an open receptacle, to fly to; and the vegetative stratum will ever be left sufficiently dry. 157. NARROW RIDGES.

But if the vegetative stratum can be kept sufficiently dry, by the means of deep interfurrows, why so nice about the convexity of the surface? Because if the surface abound with hollow places, or even be quite flat, water will stand, during heavy rains. Wherever water stands, on loose mold, a

157. puddle is formed. Every puddle is reduced to a crust, as soon as its moisture is dried up:—and a *baked* surface, of a tenacious soil, is certain injury to the crop.*

ARABLE BEDS. JANUARY, 1799. The difficulty of laying up land, in ridges, or beds, of ten full-sized plits, or about half a statute perch in width, is, in itself, an objection to them: and the circumstance of their requiring, even under the best workmanship, plits of different dimensions, may be considered as a still greater. But it is indispensibly requisite, that retentive soils should be free from surface water, during winter, and wet seasons; and narrow ridges cannot be reversed, with plits of uniform dimensions. Yet narrow ridges, which are readily thrown down, to a level, so that the soil can be conveniently harrowed, rolled, and cross-plowed, in summer, and afterwards gathered up to lie dry in winter, appear to me the most eligible, for *arable* lands, lying on *retentive bases*. All that remains to be settled, in my mind, respecting this subject, is, whether ridges of *ten*, or of *eight*, plits are preferable. The

* See MIDLAND COUNTIES, MIN: 21. on this topic.

latter is, doubtless, more easily laid up and reversed, by ordinary workmen. But the former incur fewer interfurrows; are more convenient for sowing (as will appear), and are more readily, and more completely, harrowed (in the manner already shown) without treading the land, than arable beds of any other width. And, *under accurate management*, I think they are, on the whole, the most eligible. 157. ARABLE BEDS.

158.

DECEMBER 7. I wished to expose a foul part of F. 1. to the frost; in order to get it as clean as the rest of the field, in the spring; and I took a plow into the field, to find out a method of doing it, in the most effectual manner. I began to plow it in bouts,—to lay two plits, back to back, perfectly covering the unstirred interval. This laid it in very high ridgets, with deep trenches, and fully answered my purpose. But the horses were obliged to draw upon the land to be plowed, and the soil was too tender for them to draw there, with propriety. FALLOWING.

158. Therefore, instead of plowing it, in bouts,
BALKING. I *balked* it, thus: I gave the plow all the *land* I could, and dropped the first pair of plits, short of the old interfurrows, in which the horses drew. The second pair, in the same manner, I dropped short of the plow-furrows of the first pair, and so continued till the ridge was finished.

The plow carried a width of about eighteen inches, about twelve of which it turned upon a *balk*, of six or eight; so that, although but a part of the soil is stirred, not a green speck appears:—nothing but mold and roots are seen.

I observed, that the more exactly the plits lie upon the balks, the greater quantity of surface is given, and the more it exposes the *edges* of them both. But it leaves the plits whole, glazed, and unporous: whereas, by leaving the balk something narrower, and letting the edge of the plit overhang the preceding plowfurrow, the inverted sod is rent open; the roots are, of course, partially disengaged, and effectually exposed, to the inclemency of winter.

Although this method of plowing is entirely new to me, I was presently convinced

that it is not *original;* for I had not gone twice the length of the field, before the plowman, with a scratch of the head, and a patriotic grin, told me, that it is *his* country method of plowing; and calls it *raftering* (I suppose from its giving an appearance similar to that of an uncovered roof); but BALKING (or HALF-PLOWING) is the most expressive of the operation.* 158. BALKING.

159.

DECEMBER 9. See the 5th. Yesterday, made a beginning to rough, and today, to fine harrow the lands: and the BEAN GROOVE being finished, tried to draw the channels. See MIN: 148. BEAN GROOVE.

The soil harrows, as fine as a garden; but, it being neither wet nor dry, the splayed coulters do not work to my wish. The mold is moist enough, to stick to them, but not wet enough, to slide off.

* For further remarks on this operation, see NORFOLK, Article *Rice-balking*. Also MIDLAND COUNTIES, MIN: 87.

160.

SAW HORSE.

DECEMBER 9. Wood, to be burnt in a stove, should be cut into short lengths, and the common saw-horse makes the cutting of it a tedious, labor-consuming work.

Today, I thought of, and a jobbing carpenter soon put together, one which shortens the labor, considerably.

It stands perfectly firm; and the piece to be cut lies steadily, without holding. The saw always passes freely; for the *saw-carf*, instead of binding, is always open, till the parts separate, and, by their own weight, fall on opposite sides of the horse. It appears to have simplicity and utility enough, to recommend itself, to almost every branch of workers in wood.

The common tottering cross-cut saw-horse requires two men to hold the piece, to make it equally as firm as this. The piece to be cut is fixed in two seconds. See PLATE IV.

161.

DECEMBER 21. The oat straw of Adscomb farm is, this year, as good as middling hay; so fine and full of herbage (grown on the ley of the Twenty Acres). At home, we have nothing but bad barley straw, or the refuse of wheat straw. Yet it is convenient—indeed necessary—that the milking cows, and oxen, should be near home; and that the young stock, and dry cows, should be at Adscomb. But home and Adscomb are two distinct estates; and, by the leases, I cannot remove the straw, from one to the other. FARMS.

This is a very great disadvantage of holding distinct farms, under different landlords. The home farm not being large, we are often in want of litter, while heaps of straw are rotting, elsewhere. But worse—we cannot afford to save a sufficient quantity of barley, or oat straw, for straw hay, and at home it must be consumed.

The advantages of an entire, compact, ring fence farm are innumerable. It is

161. FARMS. managed with ten percent less expence, and fifty percent less trouble. I would sooner manage a thousand acres, in one entire convenient farm, than a disjointed one, of barely three hundred.

162.

EXPENCE of OXEN. DECEMBER 21. See MIN: 153. From that time to the 15th of December, twentythree days, the ox carter had sixtyfive trusses of hay. But he had six oxen to feed with it, two days and nights; and five, two days and nights more; beside an odd horse, at different times: therefore the team of four oxen, did not eat more than sixty trusses, in twentythree days, or two trusses and 5-8ths, a day.

It was good clover and raygrass hay, worth from 50 to 55*s*. in London; but at home, 48*s*. is a good price for it, this year: on a par, 45*s*. is the value of it.

Thus the *gross charge* of a team of oxen, eating hay, and working every day, is, on a par of years, 22*s*. 6*d*. a week.

But, surely, four oxen, eating half a load of hay, will make more than half a load of

dung, a week. A load of dung, at home, is worth from 5*s*. to 7*s*. 6*d*. Say $\frac{1}{4}$ of a load, (including litter) at 6*s*. is 4*s*. 6*d*. 162. EXPENCE of OXEN.

Therefore, the *neat expence* of a team of working cattle, *during the six winter months*, is, on these data, eighteen shillings a week, or *three shillings, each working day*.

163.

DECEMBER 21. See MIN: 156. Shod their outside claws *behind*. *Cast them*. I am convinced, it is necessary to shoe oxen, which work constantly; their hoofs are worn so thin, it is difficult to shoe them. SHOEING OXEN.

164.

JANUARY 1. The leys and meadows of Woodside lie too flat: the water has lately covered the grass, in many places. This morning, took a plow, and drew furrows through the dips and hollows, in which it stood, making outlets, into the ditches. SURFACE DRAINS.

The grass will come sweeter and earlier

164. in the spring, and the cattle be permitted to feed later, and sooner, without poaching the soil.

165.

LAYING OUT FARMS. JANUARY 8. Perhaps, a farm should be divided, agreeably to the nature of its soils, if various.

Arable land should lie in large, regular, straight-lined fields.

The size of the fields should be as that of the farm.

The farm house should be near the farm yard; the farm yard near the barns; and the barns near the centre of the arable lands.

Manure is necessary to agriculture; stock necessary to manure; pasture and meadow land necessary to stock.

A suit of pasturing paddocks are convenient; about home: arable land should be near the barns, and farm yard. Meadows, woodlands, and sheepwalks may lie at a distance, with less inconveniency.

Fences are expensive incumbrances on a farm.

Therefore—had I a thousand acres, of

uniform soil, equally suitable for grass or corn, lying on a level, within a ring fence, to divide and lay out into a farm, with convenient erections, I would proceed thus: 165. LAYING OUT FARMS.

Within the irregular figure, I would endeavor to inscribe a square, or parallelogram, containing about four fifths of the whole (were it a thousand, or were it but a hundred acres). In the center of this, I would erect, and round the erections, lay four paddocks.

The margins I would convert into wood and grass land: the grand area, into four arable fields: the paddocks into pasture, and garden ground, for the use of farm stock.

The creeks, and irregularities of the margins, I would fence off, plow, and sow with the seeds of trees and shrubs; leaving them to be nursed, by nature, and strong fences.

The grass land would be sheep walks, and hay grounds, alternately.*

The arable, in four divisions, would, in perpetual uniform succession, receive the

* This is the most objectionable part of the above Minute. Lands, equally eligible for grass and corn, should, *in ordinary situations*, produce them in alternacy. But see the foregoing OUTLINE, p. 29.

165. LAYING OUT FARMS.

occupants of the four-years round.* The paddocks, too, would relieve each other; always keeping three, for pasturage or forage, and one for cabbages, turneps, potatoes, and other roots and herbages;—for the use of farmyard stock.

But—were the soil various; some of it affecting corn, some grass;—the surface irregular, &c. &c. I would endeavor to steer in the middle way, between nature and convenience: I would endeavor to approach as near to regularity, and method, as the nature of the soil and the aspect would permit.

But—were I to enter on a farm, already inclosed and divided, and erections raised, I would endeavor to throw the arable into large DIVISIONS; to keep the hay grounds and sheepwalks, at a distance, and a few pastures, &c. about home.

On principles, like these, though undigested till now, I have proceeded, since I commenced farming. I found two hundred and ninetyone acres, of clay, strong loam, sandy loam, sharp gravel, and almost every

* Fallow, or fallow crop,—spring corn,—clover,—wheat.

intermediate soil, scattered over a country of five or six miles in circumference,—divided into fiftyseven fields of different sizes; and fortyeight pieces, strowed over five or six detached common fields. 165. LAYING OUT FARMS.

The crops, too, (the farms having been occupied by different tenants) were as straggling as the fields: here a plot of corn, there a piece of grass; here a rood of wheat, there a rood of barley, lying by the side of half an acre of peas, or of summer fallow. This made the commonfield land particularly teazing, and suggested the idea, of *classing the pieces*,—of considering the several scattered slips as *one piece*: and of cropping each piece, with one and the same crop.

Thus, instead of sending a team, to plow half an acre, in one place, and then sending it a mile, to finish its day's works, in another; I now (in effect) send two or three into a large piece of fifteen or twenty acres; where, without interruption, special attendance or attention, they keep on, until it be done; the same as if it was an entire inclosure.

The conveniency of this soon started the

165. LAYING OUT FARMS. thought of *classing the fields*, of throwing a number of small contiguous inclosures, into one large DIVISION; considering this as ONE FIELD.

This plan I have been executing, as fast as I could consolidate the crops, with propriety. I have already classed them, and another year or two will complete my plan.*

Thus, one hundred and five distinct parcels are compacted, into eighteen sizeable DIVISIONS; with this advantage, that they may easily be reduced, again, to small fields, when occasion requires: but with these heavy disadvantages, compared with entire fields, there are two and twenty, instead of four or five, acres taken up, by *fences*;—the influence of the sun and wind is weakened; the teams are retarded, by the fences, at least one acre in four or five, if straight, if crooked, more;—and the fences, in defiance, breed weeds and vermin. But, in point of attention, and of time saved, in fetching and carrying implements, they are equal to entire fields; and this last is a tax

* See the LIST OF FIELDS, classed agreeably to this plan, in the foregoing DESCRIPTION of the FARM.

upon a straggling farm, of which no one, but the holder of such a farm, can form an idea. The attendance and attention, too, are material: I would sooner manage a well classed farm, of five hundred acres, than an unclassed one, of two hundred and fifty. The labor of fencing, likewise, is considerably lessened. 165. LAYING OUT FARMS.

To class a farm, judiciously, is a work of some time: two or three years, at least. Clover or ley herbage, I find, the most convenient mean; for on this, wheat may be sown, the first, the second, or the third year; and, of course, one field can wait, till another, and all of the same class or division, be ready. The fallow crop may be missed, or two be inserted, &c. &c.

The new names, which I have given to the fields and divisions, will be particularly convenient, in the DIARY,* and will easily be recollected; because I have made north the head of the page, and proceeded, regularly, from west to east (except the garden fields and paddocks). "B 1." is much sooner

* The Writer has kept, and still keeps, a register of the business of each day.

165. spoken, or written, than Lower left-hand
LAYING OUT FARMS. "field:"—P.1." than Rippinger-lane field."

Another very great conveniency of classing a farm is, the field accounts are more easily kept.*

Perhaps, another general rule, which ought to be observed, in classing a farm, is this. If part of it is wet, and part dry, there should be two sets of arable divisions. Thus, I have laid out one suit of arable, at Adscomb, and another, at home; that, when the latter is too wet, to work, the teams may not stand idle: beside, wet land may generally be sown, earlier in autumn, and later in spring, than dry; and, in the reverse, dry land may be sown later in autumn, and sooner in spring, than wet: and perhaps the most delicate part of management lies, in keeping the teams in constant work, and sowing in season.

FARMS. In this point of view, a varied soil is preferable to one which is uniform: but a varied soil requires a various management, and a variety of implements. For a light dry soil should be plowed, by two horses, abreast:

* He has likewise kept a regular account of the labor, &c. of each field or division.

—stiff, wet land, frequently, by three or four, at length: A short iron-clad plow, and flat harrows, are most proper, for that; a longer wooden plow, and round harrows, for this. Therefore, a multi-soil farm is managed, at a somewhat greater expence, and calls for closer attention, than one whose soil is of a uniform nature. 165. FARMS.

166.

JANUARY 11. Straw yards ought to be kept well littered, in wet weather. STRAW-YARDS.

The oat straw and pea halm, of Adscomb, was, this year, too good to litter with; the cattle eat them, as clean as hay, and the late rains reduced the contents of the yard to a bed of mud. The cattle could not lie down, comfortably; — they set up their backs, and looked as if halfstarved; though they had plenty of meat.

Littered it well, with rubbish, from the stackyard. And though their fodder is the same, they look fifty percent better, for the litter.

Lying in dirt, no doubt, chills their limbs,

166. — prevents their sleeping, comfortably; and, by filling their coats with filth and dirt, prevents their licking themselves.

STRAW YARDS.

167.

HAZARD of FARMING

JANUARY 16. Last night, an ox that had been ill, for some time, was found to be in a state of sufflation (swoln, sprung, "blown," as it is here termed) and was stabbed, in the side, to prevent his immediate death. But this not relieving him, he was stuck, and opened.

SUFFLATION.

Although this is an extraordinary case, yet, from this and the case mentioned, the 29th October last,—and from much reflection on the subject, since that time,—it appears to me, that

The ordinary CAUSE of SUFFLATION is, simply, a stoppage of the alimentary passage.

The MEANS, the *ordinary operation* of the stomach.

The EFFECT, a suppression of inspiration.

Because—(I understand) the disorder and effect are the same, whether the stoppage

be effected by green clover,—by a turnep, —or by a twisted hay band. And perhaps, generally, it is not so much the quality of the food eaten, as the manner of eating it, which causes sufflation. 167. SUFFLATION.

Because—in the present case, there was no sign of *extraordinary fermentation;* nor could the intestines be inflated from the lungs; for the passage, from them to the mouth, was obviously free (this I remarked particularly). But, perhaps generally, although the quality of the aliment affects not the cause, it actuates the means,—gives the degree of disorder. Thus, the rarefaction, by the digestion of succulent clover, may be greater, than that which is caused by the digestion of dry hay.

The CURE. Perhaps, while the lungs have liberty of expansion, there is no fear of death, by sufflation: and, perhaps, while the internal air has free egress, through the coats of the abdominal cavity, there is no fear of a total suppression.

Therefore, if a remedy is not at hand, a vent should be made, and kept open, to evade the effect, till the cause can be removed.

167. SUFFLATION. Perhaps, to clear the œsophagus, run the ravelled end of a stiff rope, down into the stomach.

To assist in this, and perhaps to force a passage through the intestines, pour salt and water, into the stomach.*

If the beast is on its legs, run it about: if a hill is near, run it *up* the acclivity, to give the air an opportunity of finding its natural vent.

If the animal be down, and cannot be got up (as was the case in the present instance), lay it on the *off* side,—and raise its fore quarters, as high as possible.

The PREVENTION. If the food of cattle be *turneps*, whole, such as they can attempt to swallow, without biting, should have a chop through the middle, flat-way; if turneps cut—they should be *sliced*, not cut into *square* pieces.

All *hay* or *straw bands* should be carefully untwisted, before they are given to cattle, or thrown into the yard, or other places where cattle may come.

Perhaps, *cabbages* should be quartered, or the cores taken out.—Perhaps, it was the

* See MIN: 142.

core or stalk of a cabbage, which blowed the cow. 167. SUFFLATION.

Perhaps, if the food of cattle be *clover*, or other succulent, rough leaved herbage, muzzle them;—put on each a PARTIAL MUZZLE, wide enough to suffer them to lick in their food, gradually, and strait enough to prevent their eating it, too greedily.

For, perhaps, it is eating too fast, for the salival secretion, which causes the stoppage. Perhaps, the aliment is thrust into the gullet, before it is sufficiently inviscated, and the œsophagal glands being unequal, in this case, to the extraordinary task of sufficient lubrication, it lodges in the alimentary passage, unable to reach the stomach. But if, by a PARTIAL MUZZLE, their voracity can be made to keep pace, with the secretions (of the saliva, and the mucus of the œsophagus), the disorder, it is highly probable, may be prevented.

A discovery made, by opening the bullock, is that of his entrails being cut, with the knife, in stabbing him;—for he was stabbed on the *wrong side*. He lay on his *near* side, and the servant, not knowing the difference, opened the *off*.

167. SUFFLATION. I could not, however, blame the man; for had I been present, I should probably have made the same mistake. For, though I know, that one side is right, the other wrong; and although, a few weeks ago, I knew, clearly, the right from the wrong; yet I might not, at the time, have made the distinction.

Therefore, for my future recollection, I wrote this rule:

"Th' intestines to clear,
"Give vent on the near;
"In th' angle where join
"The hip-bone and loin."

I pointed out the mistake and the consequence, to the bystanders: for had he been the best ox on the farm, and had recovered of the sufflation, he could not have lived; as, not only the maw was pierced, with a large knife, but some of the smaller intestines were cut; and for their recollection, I ordered every person, about the yard, to get the rule by heart. Then, tied it upon an elder pipe,* and hung them up, readily to be come at, in case of an accident.

* To insert in the orifice, that the air may escape freely.

168.

JANUARY 18. See the 11th. Notwithstanding the late and present severe season, they look much better, now, than they did, in the open weather, with a scarcity of litter. STRAW YARDS.

Therefore, much of the fodder, perhaps one third, is necessary, in an open yard, to be used as litter.

In a house, on a dry platform, little litter is wanted.

Therefore, the same quantity of straw will winter more cattle, and afford more *dung*, on a covered platform, than in an open yard. FODDER

But cattle, in a house, want much more attendance; and whether excrements alone, or a mixture of excrements and straw, is the best manure, may be a moot point.

169.

JANUARY 26. Yesterday, put the oxen to the dung cart, for the first time. They OXEN.

169. had not been harnessed, for three weeks be-
OXEN. fore; and, at first, they were aukward; especially at backing to the heap. Full-grown oxen, in general, are much longer-made, than horses;—too long, for common shafts; they have not room to back the cart.

Today, put a tight, nimble, short-made ox, into a light cart, and he performed very well. I do not see any reason, why an ox, with equal practice, should not back a cart, as well, as a horse of equal weight.*

On leisure days, or leisure hours, practice them, in a light cart; first down-hill, then on level ground, and lastly up-hill.

Teach them, too, to guide with whip reins; first single, then double, next with a loose plow, and lastly to make a furrow.

* JAN. 1799. The shoes of a horse, it is observable, are better adapted to this action, than those of an ox. A ready and secure method of shoeing oxen, with SINGLE SHOES, as horses, would, I have long been of opinion, be a valuable discovery.

170.

JANUARY 27. There is a right way of doing every thing;—even of forming a dunghill. One which we are carrying away, today, is improperly made. It is much too narrow,—namely about eleven feet wide:—the men are in each other's way; they have not room to fill the carts. DUNG-HILLS.

A mound of dung or compost should not be made less than fourteen, nor more than eighteen, feet wide. This size gives room for two men, behind, and one, on each side. If it is narrower, the men at the wheels have not sufficient employment;—if it is wider, they have too much; nor can they reach the cart, without moving their feet; and a step takes up nearly as much time, as throwing in a shovelful of compost.

The sides of a dunghill should be nearly upright, and not too high; that the wheel men may stand on the slips, to fill.

Perhaps, one rod wide, and a quarter of a rod high, *when settled*, is the best form of a dunghill.

171.

171.

OXEN. JANUARY 30. This is the fifth day the oxen have been at dung cart. The first and second, I could not persuade the men, that the grass would grow so well, from the dung carried on, by the oxen, as from that drawn on, by horses. Today, the carter voluntarily confesses, "He never could "have thought that they would have done "so well." As to my own part, I am more and more convinced, that whatever horses do, oxen can do, temporarily. But whether these, like those, can work, every day in the year, is yet a doubt with me.

172.

SUFFLATION. JANUARY 30. See the 16th. Bound a four-strand, three-inch rope, with strong waxed thread; in the manner that sailors *serve* their shrouds and cables. Left an inch and an half, of each end, unbound;—un-

twisted the strands, and made each end into a tuft; and hung it up with the vent-pipe. 172. SUFFLATION.

In case of sufflation, one of these tufts to be oiled, or otherwise well greased, and run down the gullet, clear into the stomach.

I had cut it four feet and a half long, before I found, that from the mouth to the hindmost rib, of a large ox, measures full five feet and a half. But, in use, the hand must follow it to the root of the tongue; and it may be long enough.

DECEMBER, 1776. But though the diaphragm reaches the hindmost rib, towards the upper part of the cavity, it crosses the ribs almost at right angle; and at the lower part of the cavity, it is tied to the brisket: the length of a middle-sized bullock's œsophagus, which I measured, today, is but three feet eleven inches.

173.

FEBRUARY 2. Until Newyearsday, we had a remarkably fine open winter. Straw-yards, in general, were not opened, till the middle of December. HARD FROST.

The first week in January was very bleak,

1793. windy, rainy, weather; excessively cold and disagreeable.

HARD FROST. On Sunday the 7th, there was a storm of rain and snow, and on Monday morning, a deep snow.

From that time, till yesterday (three weeks and four days), we have had very severe weather; a continuance of frost and snow, with high winds, from the southeast; from whence all the snow and cold weather came.

The frost was not intense, till Monday the 22d; the ground under the snow remaining unfrozen. On Monday night, it became very severe. On Tuesday, (but not before) the ground was hard enough to bear the dung cart.

The snow falling remarkably dry, with a high wind, it was very much drifted;—in some places, six or eight feet deep;—and the crowns of high ridges were left entirely bare.

WHEAT. I observed, that wheat, which was exposed to the weather, soon became black and withered; while that, which was covered with snow, remained wholly green and vigorous.

The frost and wind continuing, all pro- 173.
minences, and the areas of large fields, were WHEAT.
left free from snow; and the mold, finely pulverised by the intenseness of the frost, began to be blown from the roots of the corn.*

The last six days and nights of the frost were extremely intense. Yesterday morning, the wind crept round, to the south, and the air became mild.—Today is as soft as April, and the snow, except the drifted, has vanished without rain.

The EXPERIMENTS, made, the 29 September last, on SPRING CROPS SOWN IN AUTUMN, stand thus:

The BEANS, which were covered, have not BEANS.
received much injury; but those which were exposed, are as black as coal, and some of them wholly destroyed:—the roots quite dead.

Of the OATS—the blades are much in- OATS.
jured; but the roots appear to be unhurt.

The SUMMER TARES, which were ob- TARES.
noxious to the frost, are greatly hurt; but do not seem to be entirely destroyed.

But what surprises me much, the BARLEY BARLEY.

* This, an old laborer tells me, was the cause of much fatality to wheats, in the long frost of 1739.

173. has stood the inclemency of the weather,
BARLEY. better, than a fellow patch of wheat, experimentally sown the same day. I expected to have found it totally cut off; but I see no other vegetable, whatever, which looks so vigorously, WINTER TARES excepted; and these do not seem to have received the least injury.

WEEDS. The *wild mustard*, which came up among the early sown winter tares, and which stood above the snow, is cut down to the ground.

EFFECT of FROST. Gates, which swung clear before the frost, dragged, during the frost, but now again swing clear. A foot path, across D. 2. made at random in the snow, is considerably higher than the rest of the field. It looks as if it had been raised, by art, rising more than an inch, above the adjoining turf.

I apprehend, that, where the surface was freely exposed, it was raised near two inches. Surely, this must be of service to a stiff soil: for though it fall again, it perhaps does not unite, so closely, as it did before the expansion. Perhaps, its texture is sufficiently broken, to admit the slender lacteal fibers.

Perhaps, snow preserves the present crop, and frost prepares for the future. 173.

174.

FEBRUARY 5. It is said to be a custom, in the east of Kent, to feed cart horses, without hay,—on corn and chaff alone. But the carters attend them almost all night; which is not the custom of this country, and would be, of all others, the most difficult to introduce. CART HORSE HAY.

On the hills of Surrey, the farmers *rack up* with straw. This eases the carter; but, perhaps, it is not so good for the horses, as a regular supply of corn and chaff.

Around here, they give their horses as much hay as they will eat; limiting their corn, only. This is a vile custom. The carters care not how much hay their horses waste, nor how little attendance they give them; for they calculate, that the less chaff they have, the more hay they will eat. The horses, therefore, are suffered to swallow down their corn, that the carter may have an opportunity of indulgence,—perhaps

174. CART HORSE HAY. unmixed with chaff, that they may dispatch it the quicker: of course, a great part of it passes through them, whole; affording, it is probable, little nourishment to the animals.

I have adopted the middle way:—I allow them hay enough, to *ease* the carter, but not to make him *indolent*; enough, for the horses to eat, while he is asleep, but not sufficient to satisfy them, without a great quantity of chaff.*

175.

BEAN GROOVE. FEBRUARY 6. See 9 Dec. The ground is still exceedingly wet and rotten; but I am learning to use the implement, and drop the beans; to be ready for fine weather.

The splayed coulters do not leave clean grooves: the soil is so very adhesive, it will not part freely from them, but curls up into flakes, which the elasticity of the intervals

* The first allowance (see 22 Nov.) was a truss to each horse, a week. But the Writer, afterwards augmented it to a truss and a half, a horse, a week.

throws down into the grooves; leaving them rough; though sufficiently deep. 175. BEAN GROOVE.

This makes the task of sowing the more difficult: instead of casting the beans, by handfuls, in a free open trench, they are obliged to be dropped, one by one, between the flakes.

Near the interfurrows, where the soil is sufficiently wet, they leave channels of three or four inches deep, with smooth glassy surfaces. I hope, it will, by and by, be sufficiently dry, to work without clinging.

If I can get them to work, in this soil, they will easily work, in any other; for a more untoward one lies not on the face of the globe: it is neither clay nor loam. It has the sticky clingy quality of clay, without its firmness.—Between wet and dry, it is impossible to cut it;—a razor would not separate it;—it clings, like birdlime, to every thing that touches it. SOILS.

Being in hopes, that it would have passed more freely, from wood, than from iron, I cut a piece, in the form of a boat, and put it in the place of one of the coulters:—but, before it had gone ten yards, it was loaded five inches thick, on either side, from head to stern.

175. SOILS. I have not the least expectation of improving the implement, and must put up with the tediousness of dropping; for the bean process, which is afraid of a shower, is not worth a grain of sand. Even *dropping* will be less expensive, than *planting*; besides the convenience of hoing them, expeditiously, with four hoes fixed in the same implement.*

Planting beans is not the custom of this country; twenty shillings an acre would not pay the expence. If, therefore, I cannot contrive to draw the drills, by horses walking in the interfurrow, I must sow them broad cast, or lose my bean seedtime, as I did last year.

DRILLING. DRILLING is an expensive process, and wants much more attention and attendance, than sowing broadcast. What an excellent broadcast season we had six weeks ago!

FALLOWING. But FALLOW CROPS or SUMMER FALLOWS are necessary; and who would not be at some trouble and expence, to save a year's rent and taxes? and to gain one crop in four.

But, says the summer-fallowing farmer,

* But see MIN: 202.

ground must be plowed, to free it from root weeds, and animalcules; and, if a crop is gained, the soil is exhausted. 175. FALLOWING.

Granted.—I would not wish that it should have half a plowing, less, than the soil of those who summer fallow, once in three or four years; and the crop itself is a source of manure. Beside, it must be a poor crop indeed, which will not pay for an addition, equal to double its exhaustion.*

Perhaps, generally, if stiff land be very foul, it cannot be *cleansed*, without SUMMER FALLOWING. But, *perhaps*, the stiffest may be *kept clean*, by FALLOW CROPS. FALLOW CROPS.

But, perhaps, beans are the worst of all fallow crops; common horse beans:—mazagans, a sort of small garden beans, are preferable.† BEANS.

* This argument holds good, only, where *additions* can be *purchased*.

† JAN: 1799. When this was first published, I was a stranger to the Kentish practice. See SOUTHERN COUNTIES.

But it is to be observed, here, that the practice of Kent, though admirably adapted to the lands on which it is pursued, is unsuitable to the species of soil which is the subject of the above Minute; which *cannot* be laid flat, in winter, and trodden, in early spring, with propriety.

175. Potatoes occupy the ground, too long, to
POTATOES. be eligible.

TURNEPS. Turneps and cabbages leave the soil at
CAB- liberty, in the former part of the season, but
BAGES. occupy it, in the heat of summer.

And, perhaps, those crops which can be got off, early enough, for the soil to receive a MIDSUMMER FALLOW, are the fittest for fallow crops.*

PEAS. In this point of view peas are the best—perhaps the only—GRAIN crop.—Mazagan beans, if got in very early, may do.

TARE HERBAGE. But, perhaps, the most eligible fallow crop is TARE HERBAGE; especially summer tares. The wane of March, or beginning of April, is early enough to sow, and they may be eaten off, or used as green forage, or made into hay, the latter end of June, or beginning of July.

Supposing them to come in succession, between wheat and spring corn, and supposing the wheat to be off the ground, the latter end of August, and the ensuing crop of spring corn to be got in, the latter end

* The principal objection to a DOG-DAYS' FALLOW is, that it interferes with haytime and harvest.

of March, the soil will be sixteen months, totally unoccupied, and two of these the best fallowing months in the year; namely, July and August. 175. TARE HERBAGE.

Beside, tare *herbage* has, probably, another advantage over *grain* crops: perhaps, it leaves the soil in better heart, for the succeeding *corn*.

176.

FEBRUARY 16. Yesterday, began to sow beans in grooves; the men covering them, with their feet, as they passed along. But this is tedious: three men did not sow, and cover, more than an acre. SOWING BEANS.

Today, I have had six men at work. They have sowed near four acres. They did not tread them in; but walked by the sides of the drills, casting them, where it was open, and dropping them, where it was flakey. This expedites, considerably, and, the day being fine, the harrows covered them effectually.

In channels, tolerably open, one man, in practice, might sow an acre a day. There are six on every halfrod land; a halfrod

176. land, a mile long, is just an acre: therefore,
SOWING BEANS. a man, who sows an acre, has six miles to go. Supposing that he *works* eight hours, his task will be, exactly, three quarters of a mile, an hour. A man, in full practice, would do it, with ease; and would, of course, *sow* them for 2*s*. an acre.

177.

OXEN. FEBRUARY 26. To try, still farther, the versatility of oxen, I keep the horses at plow, and do the carting with those. I find them carry out dung, bring home hay, carry in straw, collect fire wood, or fetch in turneps and cabbages, with the docility of horses.

178.

SUFFLATION. FEBRUARY 27. See 29 Oct. 1775. This evening the same cow was blown again, by the same aliment, cabbages, and again recovered, on applying the same remedy, salt and water.

179.

SUCKLING CALVES.

FEBRUARY 28. A calf, which cost a guinea, at three weeks old, sold, yesterday, at eight weeks and five day sold, for three guineas, and therefore paid above 7*s*. a week.

Perhaps, seven shillings, a week, at nine weeks old, is a greater profit, than nine, at twelve or thirteen weeks old. Perhaps, this calf would have sucked as much milk, before it would have been thirteen weeks old (four weeks older) as it has done, since it was three weeks old—(which is six weeks); and therefore ought, at that age, to have fetched five guineas,—a price which could not have been expected.

Perhaps, generally, suckling calves, after they are ten weeks old, is bad management; a remarkably thriving calf,—a bad market, &c. excepted.

JULY, 1777. The Writer is still of opinion, that, to suckle calves, in general, after they are ten weeks old, is bad management: for, by accounts kept on this subject, those

179. of nine or ten have paid full as much, by the
SUCKLING CALVES. *week*, as those of twelve or thirteen. And although a calf, of six weeks old, may suck nearly as much milk, as one of twelve weeks old, yet, the first month or five weeks, the quantity is considerably less; and this advantage of their *infancy* is doubly as valuable, to nine, as it is to twelve weeks.

180.

PLOWS. MARCH 6. I am convinced that the swing plow* is the only plow of general use; especially for stiff land: it will plow it round, or flat; wet or dry; foul or clean.

But the common swing plow of this country, has many imperfections.

The beam hangs too low.

The coulter stands too near the breast of the plow.

The bosom is too hollow.

The *stern* is too wide, at the bottom, and too narrow at the top.

The *keel* projects behind the feet of the handles.

* A plow without wheel, or foot, to support the beam.

The wrest or arm is fixed too low. 180.

The handles stand too much to the right. PLOWS.

The coulter is fixed by *wedges*, and its stem is too square.

When plowing (particularly when crossing) a foul, rough fallow, the clods and rubbish, if not incessantly put off, presently reach the beam, and of course draw the plow out of the ground.

If they accumulate between the coulter and the breast, it has the same effect: if the plowman has not a boy extraordinary, he must frequently stop his team, to unburthen his plow of its incumbrances.

The mold, especially of a tenacious soil, will not slide off a hollow bosom, but lodges and accumulates, perhaps, several inches thick: this greatly increases the resistance, and prevents the plit from turning.

If the stern be too wide, at the bottom, it sets the plit on edge, and hinders the turning of it; especially if it be narrow, at the top: a wide-sterned plow, also, much increases the resistance, and is fit for the stirring of fallows, only.

If the handles are fixed, too much to the right, the plowman is debarred from keep-

180. PLOWS. ing a look out, forward: but a neat plowman will have his eye, now and then, before the horses, let the consequence be what it may. He therefore twists his plow out of the upright, inclining it to the left; and this is a cause of bad plowing. The plit, instead of being formed, *square*, or long-square, is cut of a *rhombic* form; and, of course, the grass and weeds, instead of being effectually buried, and having a crest of mold raised over them, are exposed on the surface, without a sufficiency of loose soil, to cover the seed. Instead of each plit being discriminable, by a ridge of mold—by a *crest*—it shews itself, by a drill of grass and weeds—a *mane*—and the seed lies exposed on the surface, without its being in the power of harrows to bury it. But this is not the whole evil: by twisting the plow out of the upright, the fin of the share, and the arm of the plow, instead of being on a level with the point of the share, and the keel of the plow, are elevated, perhaps, two or three inches; and, were the plits to be removed, the sub-surface, instead of being smooth and even, would be found in wavelets; a cross section would be ser-

rated, as the edge of a saw. Many of the roots of grass and weeds would be found uncut, or cut too high, and much of the vegetative mold left unstirred. 180. PLOWS.

In order to obviate this, the plowright sets down the fin, and the wrest, that they may go level with the keel, though the coulter, the land board, and the beam handle, are out of the upright; and thus puts it out of the power of the plowman, were he ever so desirous, to make good work.

COULTER WEDGES are destructive of plow beams. I apprehend a beam would last twice as long, without them; beside their engrossing much of the plowman's time and patience.

A square-stemmed coulter is weak, and, by requiring a wide coulter hole, weakens the beam.

JULY, 1777. The Writer, ever since making the above Minute, has been solicitous to improve the SWING PLOW. He has made several fruitless attempts, which would be tedious to enumerate. He has, however, at length, had better success. He will not arrogate that he has struck out a *perfect* swing plow; but he apprehends,

180. that he has improved, considerably, the common swing plow of this country. See PLATE III.

181.

SOWING BEANS. MARCH 11. Mr. A. has lost twelve or fourteen acres of beans, by the late severe weather. They were planted in December and January. Where the snow lay thick, they are now an inch above ground; but where the soil was exposed, they are totally gone.

Is not this a strong evidence, that the months of December and January are improper for sowing beans in? for though such a winter seldom happens; yet it may, and sometimes does happen.

Perhaps, in future,—keep plowing for beans, in winter, whenever the weather will not suffer the teams to carry on dung; and begin to sow, as soon as the soil will harrow, with some degree of comfort, to man and beast. Planting beans, in mud, is a filthy, teasing business. With what alacrity the work goes on, now, compared with what it did, in the wet weather!

Sowing beans on a soil, which will not bear fine harrows freely, is *forcing* a season, —is, literally, committing a rape on the soil. 181.

182.

MARCH 16. Finished sowing mazagan beans, in open grooves, and a fine season. BEAN GROOVE.

I have no reason to be displeased with the bean groove. Now, that the soil is become pulverous, and does not adhere to the coulters, the men cast them, as fast as the teams walk, in plowing. See MIN: 176.

The seed is buried, from one to three inches deep.—Perhaps, a good depth for beans.*

183.

MARCH 20. A striking instance of bad plowing occurs, in A. 3. PLOWS.

Three lands, which happened, last year, to be plowed, after the ground had got too dry, and which, this year, happened to be plowed, by a bad plow, and an indifferent

* See GENERAL REMARKS, 1777, on IMPLEMENTS.

183. plowman, are impenetrable to the harrows;
PLOWS. while the rest of the field, notwithstanding the quick transition from wet to dry, works beyond expectation. That was plowed, with a *reclining*, this, with an *upright* plow: this with a *cresting iron*, that without one.

CREST. The utility of a crest iron* to stiff land, which turns up in whole plits, and which is in plowing, for a crop, cannot easily be communicated, but is obvious, in practice. It buries the sod, and, by *crushing* the plits, leaves the surface perfectly friable.†

184.

FARM MANAGEMENT. MARCH 21. The wet weather broke in, upon the spring seedtime. To regain the lost time, I have worked the teams, *nine* hours a day. And we have got on, very well, until today, (exceedingly close and warm): but, I find, that, even *horses*, with two bushels of oats a week each, may be over worked: one of the teams is fairly knocked up.

* See PLATE III. *Fig.* A. &c.

† In this, rivaling the TURNWREST PLOW. Noticed in the SOUTHERN COUNTIES, VOL. I. *Sect.* 5.

The *oxen*, too, are obliged to give out. Duke, who never flinched before, laid down in the field; but it was in a singularly close field, and he is a remarkably free worker. 184. FARM MANAGEMENT.

One man and a boy have sickened, and I find myself agreeably fatigued.

From those facts, I draw these inferences:

OXEN, if worked every day, should not be out of the stable, more than *eight* hours; except they have a bait in the field, in the middle of the day. Perhaps, a morsel of hay, and a mouthful of water, while the plowman eats his lunch, would be of great service to them. OXEN.

MONGREL HORSES, on corn, are not superior to oxen, on hay; but oxen on hay, are not equal to CART HORSES, on two bushels of oats, a week, each; for the team of *light, punch cart horses*, is not the worse for its work. HORSES.

BUSTLING may be over-acted; for I am obliged to relax, when the weather, and time of the year, ill admit of relaxation.

185.

SURFACE DRAINS. MARCH 24. The wheat on *round* halfrod beds, looks well, everywhere. While the *flat* rod wide lands, of H. are, in some places, hurt, very much, by the wet: more than three fourths of the roots are totally perished:—there is not a sufficient number left, for a crop; and the surface of the soil, puddled by the rains, is now baking into a glassy crust.*

ARABLE RIDGES. Perhaps, there is no danger of *baking*, if the beds lie round. Perhaps it is not the rain which *falls*, but that which *lodges*, on the surface, forming a pool, which is the cause of baking.

Perhaps, there is a medium to be observed. Perhaps, if *too sharp*, there is danger of *root-weltering*;†—if *too flat*, of *baking*.

* This fact corroborates the observation, under Dec. 5, 1775.

† Of the soil being washed away from the roots, so much, that the plants lose their upright posture.

186.

MARCH 24. The loudest clamour against the larger, especially against the *modern*, farmer is, that he sends no petty produce—no eggs nor poultry—to market. POULTRY.

Last year, I was obnoxious to the cry: this year, I have half a dozen breeding geese—half a score breeding ducks—and half a hundred breeding hens.

I have converted a court yard into a breeding cage. I have planted in it shrubs, to attract slugs and insects; with grassplots, and a smooth graveled area for the breeding coops.

They will at least form a pleasing innocent picture, under the window; and, perhaps, in these days of luxury, and in this region of infrugality, the profit may not be less than the pleasure.

187.

MARCH 24. The utility of much harrowing, at seedtime, is, to present appearance, obvious in M. and N. HARROWING IN WHEAT.

187. HARROWING IN WHEAT. Two lands in M. 1. were left to be sown, overplit; the rest of the slip being sown under. But they were forgot, until the surface became quite stale,—having lain perhaps a fortnight, or three weeks. To raise fresh mold, I harrowed and fluted them, with the nine-inch barley flute; and, in harrowing these, part of the two adjoining lands were harrowed.

The two lands, fluted, are the best, and apparently the forwardest, wheat in the piece;—the two half lands, harrowed, obviously the next. That which was sown underplit, and left unharrowed, is over-run with chickweed, and has not nearly the number of plants of the harrowed part.

One side of N. 1. was accidentally sown too thin; namely, with $1\frac{3}{4}$ bushel, an acre. Part of this was covered with the fine harrows, only,—part was both roughed and fined. The last has, now, nearly double the number of plants.

188.

COURSE of PRACTICE. MARCH 26. Finished sowing peas. I intended to have sown another field of

four acres; but the season is far spent,—peas, fit for seed, are dear: and there are a few lands, in the middle of the field, much too foul to be cropped. I have tares and barley which are unsaleable,—and I want the teams, to plow for oats. I have, therefore, sown the cleaner part with $1\frac{1}{2}$ bushel of tares, and one bushel of barley, an acre; and have left the foul lands, to lie fallow. 188. COURSE of PRACTICE.

I mean to give these two or three plowings, while the herbage is growing; and, after this is made into hay, to give the whole a midsummer fallow, for barley and clover, in the spring.

This is a sketch of my general plan of management. I mean, at all events, to get the land clean, and in tilth, for SPRING CORN and CULTIVATED HERBAGE.

189.

APRIL 4. I apprehend that much seed is lost, by sowing it over very rough plits. SOWING ROUGH GROUND.

In dry weather, when whole ground breaks up in clods, especially if plowed in wide plits, much of the seed reaches the sub-

189. soil, before it finds a resting place. For,
SOWING ROUGH GROUND. although it may not fall from the seedman's hand into the unfortunate abyss, the harrow, by shaking the clod on which it fell, may hurry it into utter darkness.

Experimentally, harrowed every second land of E. 2. before sowing; and left the intervening lands in rough plits.

JULY, 1777. The above experiment decided against the theory on which it was made. It may not, however, be generally decisive: for the superiority of those lands, which were sown over the rough plit, was I believe, *wholly* owing to the uncommon drought of the spring of 1776.*

190.

HORSES and OXEN. APRIL 4. Two cart horses have been, experimentally, kept on *hay*, *alone*, during four or five weeks. They have been tied up in the same shed, with the oxen, fed with the same hay, and treated in the very same manner. They have, like them, worked

* But see the following EXPERIMENTS, and OBSERVATIONS, on this very interesting point of practice.

every day; and though they kept losing their flesh and spirits, they have stood their work, pretty well, till today, when one of them was so completely tired, he could scarcely get home. 190. HORSES and OXEN.

191.

APRIL 10. Carters are the greatest thieves in the world. While they had their hay given to them, bound, they kept up to a truss, a horse, a week. But, lately, having shook up some of it, for the seed, their regular allowance has not been attended to. And I find that eight horses have destroyed, in three weeks, seventy trusses of hay. SERVANTS.

	£.	s.	d.
70 trusses of hay, at £3. 10s. (£4 a load, is the market price of prime hay) - -	6	16	0
6 quarters of oats, at 20s. -	6	0	0
	£. 12	16	0

for three weeks: or £2. 2s. 6d. a team, a week; besides chaff.

This extravagance of carters must fall,

191. more or less, to the share of every farmer,
SERVANTS. who does not pay close attention to the minutiæ of farming ;* and indeed, to every farmer, who does not *allowance his horses*, and *bind his hay*.

BINDING HAY. I have, this year, bound every blade, whether for sale, or for consumption. But why? Why throw away twentypence, a load, on that which is consumed at home?

Because—I kept an account, at haytime, of the field loads which were put into each stack, and I wish to know their *yield ;* that, in future, I may be able to form a judgment, at haytime, of how many sale loads each field may produce, and of how many each stack may contain.

Because,—by this precaution, scarcely a bent is wasted :—no litter made of it, in the stackyard, farmyard, &c. but every mouthful is delivered to the respective feeders. Perhaps, this alone will repay the expence.

Because—I can allowance each species of stock : I can allow each cart horse, a truss, or a truss and a half, a week : the ox team,

* In this point of view, cattle have a preference to horses ; they can but eat their fill of hay, and that they ought to have.

half a load, a week; the milch cows, one two, or three trusses, a day, if they are required, &c. &c. And I find, that, by thus stinting the quantity, the men become more careful; they look upon it as *something*, and know, that if they lavish, today, they will want, tomorrow. 191. BINDING HAY.

Thus the servant imperceptibly learns frugality, while his cattle have their food regularly. Taking "a lock from his allowance," is very different from fetching a forkful from an unlimited quantity of loose hay: for, if he drop a handful by the way, he will not say, "Never mind it, there is more "in the hayloft;" but he will return and pick it up, with "Poor things, you've little "enough of it! there is no need of waste, "God knows." Nor will he give them too much, by half, at once, and throw what they have left and blown upon, under them, for litter; but he will give them a little, at a time, and see that they eat it clean. There is a sympathy between the human and the brute creation, arising from acquaintance, which is more easily observed than communicated. There are carters who would sooner starve themselves, than

191. their horses; and among stock feeders, in general, it is obvious to common observation.

BINDING HAY.

Because—I have the satisfaction of knowing how every blade is expended;—how much each sort of hay-eating stock costs, during the winter; and of course, my hay and stock accounts (with respect to hay) are reduced to certainty. These are conveniences and utilities, which, I am persuaded, will confirm me in the practice of binding hay, for farmyard consumption.

About one third of the binder's time is taken up, in making bands. Perhaps, use hempen ropes, instead of hay bands. Perhaps, with those, he would bind it for thirteen or fourteen pence, a load, and they would not be so dangerous as twisted bands.

192.

ROLLING. APRIL 11. The PLAIN ROLLER does not appear to have that attention paid to it, which is due to its merit. It is seldom used on a FALLOW; except to burst *large* clods,

and seldomer AFTER SOWING, except to *smooth* the surface, for the sithe. 192.

Had it not been used in E. this year, after sowing, *between the harrowings*, the harrows could not have brought the soil to a sufficient degree of fineness; whereas, by alternately rolling and harrowing, it is as fine as a garden. SEMINATION.

Perhaps, rolling, even when somewhat damp, is not prejudicial; provided the soil be afterwards harrowed. I took care that the surface was *perfectly dry*, before the *last* rolling; but I took care to lose no time, *this dry weather*, between the sowing and the *first* rolling; that as little of the moisture, as possible, might escape. Rolling not only *bursts some* of the clods, but *fixes others*, so as to prevent them from rolling under the harrow; and thereby to render this the more effective.

Applied to FALLOWS, the PLAIN ROLLER is the arcanum, by which light land may be made stiff, and stiff land light. One effective crush, by a plain roller, is worth a dozen partial indentures, by a spikey one. FALLOWING.

Nevertheless, where the clods *bear* a *heavy* plain one, the SPIKEY ROLLER is invaluable. ROLLERS.

193.

POTATOES. APRIL 11. Half this week has been spent, in preparing for potatoes; when the teams ought to have been getting in seed barley.

This makes potatoes an ineligible crop, on a corn farm, and unfit to introduce into the round of fallow crops, spring corn, clover, wheat; for every thing which interferes with spring corn and clover seedtime, —every thing which requires *team* labor, in March and April, is a disagreeable intruder.

TURNEPS. In this light, turneps and cabbages appear to great advantage; they are got in, in the

CABBAGES. most vacant part of the year: they neither interfere with seedtime, nor harvest.

Perhaps, rape and buckwheat come next; beans and peas intrude on the spring seedtime; winter tares, on wheat seedtime; and summer tares, on spring corn and clover.

FALLOW CROPS. But what fallow crop is to be adopted, by the wet land farmer, who cannot, with any propriety, keep a flock of sheep?

If he cannot *fold*, he must *manure*. To such a farmer, the DUNG CART becomes, and ought to be considered as, a principal branch of labor: and the COMPOST FARMER ought to have strength enough, to put in one half of his fallow crop, in autumn, and the other half, in spring, without losing his wheat, or his spring corn seedtime. 193. GENERAL ECONOMY

194.

APRIL 12. Yesterday, began to plant potatoes. PLANTING POTATOES.

I was dubious about how to put them: whether to plant them, in trenches, and cover the plants with dung, by hand; or to plow in the dung, and dibble in the plants; or to plow in the dung, and harrow, roll, and draw trenches; or to plow in the dung, and plant them, in each alternate plow furrow, as the ground is plowed. The last requiring the least labor, I chose it.

The soil had two plowings, was harrowed, rolled, the rubbish raked out, and afterward planed, as level as a table. On this smooth surface, spread a thick coat of very

194. PLANTING POTATOES. long dung, and buried it, in flat, rod-wide beds, scattering the potatoes in every second plowfurrow, about eight inches apart, in the rows.

Being busy, elsewhere, in the morning, I did not self-attend to the planting of the potatoes. Two or three beds were finished, before I observed, that the coulter gathered up the dung; sometimes choking the plow, and frequently leaving large hussocks bulging out above the clods. Therefore, set a boy to clear the coulter; and bid him, when plowing *for* the potatoes, to draw the dung, collected by the coulter, towards him, upon the unplowed land; but, when *covering* them, to push it into the furrow: thus the plants got the *best half* of the dung.

But this only made me anxious to give them the *whole* of the manure: and a few minutes attention led me to an expedient, which at once gave them the whole of it, and left the unstirred surface perfectly free for the plow.

With a common hay rake, I found that one man could push two plit-widths of dung, upon the potatoes, as fast as two men could plant them; who planted them, as

fast as one team could plow for, and cover the plants. 194. PLANTING POTATOES.

Thus, every handful of the dung was buried, and buried immediately upon the potatoes. The plants were prevented from being misplaced, crushed, or picked up, by the claws of the oxen; and the dung effectually covered, by means of the oxen's walking upon it.

This method answers every purpose, of the more tedious way of, first, drawing trenches—next, carrying the dung on, in baskets,—and, afterward, having the trenches to fill in.*

Had not the soil been planed (rolling will answer nearly the same purpose), the operation would not have been so easy. The dung, it is true, might be *dragged* into the furrows, off a *rough* surface; but many clods would be pulled in with it, and the man must work on the plowed ground. Whereas *pushing* it in, off a *smooth* surface, is light work.

I am perfectly pleased, with this potatoe process: the expence of labor is little more, than that of a broad-cast crop.

* Which is the YORKSHIRE practice.

195.

195.

TILLAGE. APRIL 13. Yesterday, began to land up N. 6. for barley, with four oxen, single, and a team plow. They did not make so good work as I wished for. Put two of them to a whip-rein plow, double; but continued to drive them with the whale bone whip. They carried off their work more cheerfully, and much neater.

Last night, exercised them in the yard, with whip reins; and, today, they have landed up a full acre, into fivebout beds, without a driver.

OXEN. I was not aware of their mouths being so tender, as they are; I expected, that it would have been necessary to guide them, by their *rings* (this, indeed, was an idea I conceived, before I ever thought of a ring to tame them); but the *bit* is quite sufficient. I am confident, without partiality, that I have not two horses, so handy with the whip reins, as the two oxen which worked today: and, what is remarkable, they *answer* the whip rein, better than the whale-bone whip.

To employ the boy (the driver), set him to hand rake in the clover seed, sown immediately after the barley had been covered, in the most effectual and beautiful manner, with the fine round harrows. There were a few straggling root weeds, lay loose on the surface; so that, while the clover seed is effectually *covered*, without being *buried*, the soil is freed from encumbrance. 195. SEMI-CULTURE.

196.

APRIL 16. See 24 March. But what is very remarkable, the SOD WORM has taken the part, lightly harrowed, but spared that which had one tine with the rough harrows. This is, at present (though not totally free from the worm), a promising crop: that, so bad, that I mean to flute it, and sow it with barley. TILLAGE.

How this difference could be effected, by the harrow, I cannot conceive; but what makes it probable, that the harrow did influence, the distinction is obvious to an inch. The horses drawing in the interfurrow, one SOD-WORM.

196. SOD-WORM. side of a land was roughed and fined, the other side run slightly over with the fine harrows, only. That is a crop; this not half a one.*

197.

WEATHER. APRIL 16. See 2 February. The latter end of February, and the beginning of March, were incessantly rainy;—the teams could not look out. From the 6th of March, until yesterday afternoon, we have scarcely had a shower! One of the largest farmers in the parish, has not, or had not, a few days ago, sown a handful of spring corn! His peas lay a fortnight, in the field, in sacks, and were obliged to be carried home, at last. The stiff land Farmers, in general, have not yet sown an oat.

HAZARD of FARMING They plowed, before, and during, the wet weather; and, the change being rapid, the surface became perfect glass, while, beneath it, the soil was mere mud: before a horse

* This evidences, in a striking manner, that *tillage* is a powerful enemy of the SODWORM. See SOUTHERN COUNTIES, on this destructive reptile.

could step upon the land, its immediate surface was as hard as horn. 197.

Nevertheless, had the ground, which was plowed wet, been laid up in fivebout lands, and thoroughly cross furrowed,* it might, by catching the critical time, have been got fine, *with harrows drawn in the interfurrows.* HALFROD RIDGES.

198.

APRIL 18. See 1 January. It is now necessary, that the plits, thrown out, should be got rid of; in order that the surface may not be encumbered, nor the sithe retarded. To plow them back again would incur an annual trouble, and an annual expence: and to cart them off would ill suit this month. Chopping them to pieces, and piling them in heaps to rot, is tedious; and spreading the pieces, before they are digested, is encumbering the surface. SURFACE DRAINS.

The furrows were made, when the ground

* A want of cross-furrowing was, I believe, one cause of their losing their seedtime: I saw the water stand over the ridges, at the lower ends of several fields, while their upper ends were as hard as a pavement.

198. SURFACE DRAINS. was very wet; the sward of the plit of course united closely, with the sod upon which it was turned; and the severity of the winter has rendered the mold exceedingly tender and friable.

With a *sharpened* hoe, I pull back the mold upon the adjoining grass; shaving it off, close to the roots of the inverted sward,—within an inch, or an inch and a half of the level of the field. To renew the sward, I sprinkle a few hayseeds, along the brink of the drain; and, with a garden rake, rake them in; at the same time spreading the mold evenly, to prevent its fouling the adjoining grass; to which it, by this means, becomes beneficial as a manure.

The expence is inconsiderable. One man, today, had *hoed*, upwards of one hundred rods, before three o'clock. The *sowing* and *raking* do not take up half the time. The whole operation does not cost a farthing a rod; yet the above mentioned one hundred rods lay a very flat six acre field, tolerably dry.

A team which plows an acre, into half-rod or fivebout lands, makes a furrow of 3200 rods, in length; which at 8*s*. a team,

is 33 rods for a penny, or three pence for 100 rods;—therefore, the whole expence of drawing, shaving, seeds, sowing, and raking, will not amount to sixpence, an acre. 198. SURFACE DRAINS.

199.

APRIL 21. Who would plod through a bean season, in dirty weather? Those planted, the 16 March—one month ago—are already as forward (to present appearance) as those put in, the 15 Feb.—two months ago.—These are thin and weak: those, as thick as they can stand, and beautifully vigorous. Those were forced into beds of bird lime, which the succeeding drought has baked to glue: these seasonably bedded, in free, pulverous mold, and have ever since enjoyed fine weather: and, which still more confirms the impropriety of *sowing out of season*, the lands left, untouched, in rough plit, till fine weather came, though sown the latest, are now (to appearance) the forwardest. BEAN SEED-TIME.

In future,—let the soil lie in rough plits, until the beginning of March; or until

199. there be a fair probability of putting the seed in seasonably.*

200.

SOWING GRASS SEEDS.

APRIL 21. The drought set in, so rapidly, we had not time to sow the grass seeds, when the oats were sown, in A.— about a month ago. I have ever since been waiting for rain, and was glad to embrace the shower of last Tuesday.

To get some fresh mold, for the seeds to drop upon, I harrowed it, with fine harrows, once in a place, before sowing. The harrows pulled up, and shifted, many of the clods, rolling them upon the young oat plants.

To disburthen the oats, get rid of the clods, as well as to cover the hay seeds effectually, I opened the interfurrows, and hand-raked the clods into the trenches, made by the double plow; at the same time levelling the surface and covering the seeds. But finding this rather tedious,

* The long established practice of KENT strengthens the propriety of this inference. See SOUTHERN COUNTIES.

although a good job, I raked every second land, only; leaving one rough, and one smooth; except a rougher part, which was wholly raked. 200. SOWING GRASS SEEDS.

About six acres were raked (the whole being $11\frac{1}{2}$ acres); and they cost eight men, or about 2*s.* 3*d.* an acre.

The crop of oats, and succeeding grass, will shew, whether the labor be well or ill bestowed. The grass seeds of the unraked lands will be covered, only, by the roller; to have re-harrowed would have endangered the oats.

JULY, 1777. The crop of oats received no apparent benefit, by the raking; but its use, to the grasses, is obvious: the plants are more numerous, and the surface more even. This year, the Writer hand-raked in every ounce of grass seeds, whether they were sown, for annual, or for perennial leys. SEMI-CULTURE.

201.

APRIL 23. Perhaps, rolling the soil, before beans come up, is dangerous to the ROLLING BEANS.

201. ROLLING BEANS.

crops.* And, if it be left, unrolled, the clods become troublesome to the hoe; and, by rolling upon the tender plants, are hurtful.

Being afraid, that the roller might injure the heads of the plants, I only run it twice across the field, experimentally. But, after remaining a day or two, I could not perceive the least harm, from the operation; and it was, obviously, a good preparative to hoing; I therefore rolled the whole field. They had just opened into broad leaf, which lay flat on the ground

To try the degree of torture, which infant beans can bear, I marked out three or four yards of one of the drills, indiscriminately. I first rubbed the plants, between the fingers, till the leaves were perfectly bruised, and as black as ink;—and then trampled them under foot; rubbing them hard, with the sole of my shoe.

This was last Tuesday,—a week ago. At present, I cannot perceive that they have received the least real injury. The leaves, it is true, look ragged, as if eaten by slugs;

* JAN. 99. This, probably, is false apprehension. See MIDLAND COUNTIES, sect: 18.

but the stems are as high, and as healthy, as those of the neighboring plants. 201. ROLLING BEANS.

Therefore, beans, when their broad leaves lie flat on the ground, may be harrowed and rolled with safety.

To prepare the peas, too, for hoing, I rolled them, as they opened into broad leaf, and cannot perceive any evil attendant. PEAS.

202.

MAY 2. See 6 Feb. But this is false theory, which cannot be practised; it is scarcely possible to lay the lands *equally* round; and the smallest inequality prevents one or other of the four hoes from acting. HOING BEANS.

Therefore,—the beans being in want of hoing, I threw them aside, and hoed them, with a common horse hoe; the horse drawing between the rows.

JANUARY, 1799. Thus, without the least knowledge of the KENTISH PRACTICE, I was led, by perseverance, to one on the same principle; and which is adapted to RETENTIVE SOILS, that will not bear to be trodden,

202. with impunity, in early spring. See the SOUTHERN COUNTIES, Sect. BEANS.

203.

SPRING FOODS. MAY 5. Stock hangs heavy on a farmer's hands, in the month of April, and the beginning of May; especially in such a long, dry, cold, backward spring, as this is. Farmyard stock starves on straw, and there is no grass to keep them alive; and to feed, even cows, on hay, at three pound ten shillings, a load, is extravagant management.

RAY-GRASS. Raygrass, for this purpose, is very valuable. The borders of M. 6. would form, at present, a good swath of green forage.

LUCERN. But lucern seems to be the first, and best, of all spring forages. Mr. —— began to cut his, the beginning of April. Its benefit to his horses was striking; from being as rough as bears, they became sleek as moles. What a treasure a few acres would be to the milking cows! What a saving of hay, and what a refreshment to the oxen and cart horses, in spring seedtime! There is, however, some difficulty in raising it,

compared with the raising of clover or ray-grass. 203.

Rye, perhaps, comes next, as spring forage. Mr. —— had a field two feet high, a fortnight ago. RYE.

Tares are out of the question. The part of G. 1. sown the middle of August, will not be fit to cut, a fortnight hence. TARES.

204.

MAY 7. See 12 April. Finished planting potatoes, — fully satisfied with the adopted process: I mean with respect to the mode of distributing the dung: but whether the plants ought to be placed *under* or *upon* the manure, I am not yet determined. But I hope I have made experiments sufficient for a decision. PLANTING POTATOES.

The man who cut the plants did not make the most of them; he left many with five, six, or seven *eyes* in each; when, *perhaps*, one, two, or three, are equally as good. POTATOE PLANTS.

To decide this point: I drew out the buds of the large potatoes, in the manner

204. by which cheesemongers try their cheeses;
POTATOE PLANTS. drawing out a plug of the pulp, of a cylindrical form, about three quarters of an inch long, and about half an inch in diameter, with an eye in the centre of its end.

After extracting ten or twelve of these plants, out of a root of a quarter of a pound in weight, the diminution is barely apparent; at least three ounces remain. If taken from a large potatoe, the loss of weight is still proportionably less; and the remaining pulp is of equal value to the hogs, as the same weight of entire potatoes.

If one bud, with two drachms of pulp, be as prolific as seven are, with two ounces, what a saving! We have buried from ten to twelve hundredweights, an acre: as many as would have planted four or five acres, besides leaving eight or ten hundredweights of hog food.

205.

WEATHER. MAY 9. See 16 April. But that shower by no means softened the large clods, and we have scarcely had a drop of rain since,

until last Sunday. On Sunday evening, we had a heavy shower; on Tuesday night, a good deal more; and last light, a very fine rain. 205. WEATHER.

Those stiff-land farmers, who plowed in the rain, are this instant, the 9th of May, sowing their *oats!* And even after last night's steeping rain, they find a spikey roller convenient to break the larger clods. SPRING SEED-TIME.

How uncertain are the seasons in this country.

The merit of the spikey roller is conspicuous in N. 4. From a mass of huge clods, it reduced it to a tolerable state of fineness: to such a state of tilth, as all the *harrows* in the universe could not have accomplished. SPIKEY ROLLER.

Before the first spikey rolling, it was difficult to ride over it. With some difficulty, however, it was,

Spikey-rolled,	Spikey-rolled,
Cross-harrowed,	Plain rolled,
Cross-planed,	Ox-harrowed,
Plowed for the seed,	Spikey-rolled,
Sown,	Plain-rolled,
Ox-harrowed,	Sown with grass seeds,

205. Swept with the horse broom, Plain-rolled.

SPIKEY ROLLER.

The lands, now, lie as round and as smooth, as if they had been polished in a lathe. It was landed up, in winter, exceedingly foul, it has now the appearance of mold baked in an oven; without a green speck, or the smallest trace of vegetable life, to be seen.

This spring, I set the spikes in a new cylinder. The old one was cleft, on every side, from end to end: not from the age, nor the rottenness of the wood; but from the make of the spikes, and the manner of putting them in. The ends, which were driven into the wood were complete *wedges*, and and they were placed, in the very manner in which a wood cleaver sets his wedges to rend a block—in *rows*.

As an improvement, I shouldered the spikes, thus: I changed the form of the ends, which were to enter the wood, from square to octagonal; leaving a small triangular *shoulder*, at each angle of the stump (the acting end of the spike being still left square) and set them in, *a quincunx*.

206.

MAY 10. See the 2d. Finished the first hoing. The expence stands thus: $10\frac{1}{2}$ acres cost,—for HOING BEANS.

	£.	s.	d.
Plowing, or horse-hoing, the furrow intervals -	0	12	0
Horse-hoing the four equal intervals - -	0	15	4
Hand-hoing the ridge intervals	0	10	0
	£. 1	17	4

or 3*s*. $6\frac{1}{2}$*d*. an acre.

But one team was employed, in plowing ing the interfurrows of those planted in puddle: they were baked so hard, that nothing but a team plow could penetrate them. BEAN SEED-TIME.

Had they been all put in, in due season, the cost would have been under three shillings, an acre.

207.

207.

WORKING CATTLE. MAY 11. Short legged Staffordshire bulls are unfit for harness: they cannot walk, with oxen: they tire and grow sullen.

Two, which I worked, until I was convinced that I was wrong, were *cut*, today.

I do not apprehend that BULLS, in general, are unfit for labor. Perhaps, a clean limbed, long legged bull is equal if not preferable to an ox: they are more powerful in fight; why not in work?

208.

BARLEY. MAY 14. Examined the state of the spring crops sown in autumn. See 2 Feb.

The barley is two feet high, and the tips of the beards just appearing.

BEANS. The beans, which were exposed, are totally gone. Those which were covered, began to blossom, about ten days ago, and are strong and healthy.

OATS. The oats look well, but do not shoot up,

like the barley: they are not more than six or eight inches high: but the blade is broad and vigorous. 208. OATS.

The *summer* tares are no more! A few stragglers remain; but I apprehend they are *winter* tares; for I cannot distinguish, between them, and the winter tares of the adjoining lands. TARES.

A more decisive experiment could not have happened. It fully proves the winter, and the summer, tare to be distinct plants.

209.

MAY 19. Granaries should be under the eye. I have not lost less than four or five quarters of grain, of different sorts, out of the granary of a distant farm, in less than two years. GRANARIES.

Perhaps, generally, it is bad management, in a farmer, to keep, by him, corn or pulse of any sort, *in grain*. Rather let him keep it, *in straw*; or, if straw be wanted, sell it at the market price; not keep it up, for the chance of a rising market. For he incurs a certain loss of measure; and a cer- DISPOSAL of CORN.

209. tain risk,—if it can possibly be come at by carters.

SERVANTS. To quarrel with them, about it, is idle; for, in this respect, they are, professedly, thieves, to a man: and the only way to keep them honest is to treat them in character.

Notwithstanding I keep a regular account of every bushel, of each species of grain, *winnowed*, and of every bushel, *fairly vended*; and, although I take a great deal of pains to prevent pilfering, and make it a serious matter, whenever it is found out; yet I never find the two accounts tally. What, then, must be the fate of those, who do not keep a minute account, neither of the yield nor of the vent, and whose servants are *aware* of this neglect? who know, that if they are not caught, in the fact, they are clear, even from *suspicion*?

210.

CART-HORSE CHAFF. MAY 21. From the 19th of April to the 19th of May, nine cart horses eat thirty quarters of chaff:—thirty *double* quarters, in thirtytwo days, or about three double

quarters (of sixteen bushels stricken measure), a team, a week. 210. CART HORSE CHAFF.

To ascertain the *value* of chaff, I weighed a single quarter of some cut from barley hay:* it weighed 56 lb. just a truss of hay, which I value at 1*s.* 6*d.* Therefore, a double quarter of this chaff costs 3*s.* and the cutting 1*s.*—Together, 4*s.*

I then took a truss of clover hay, worth at present £3. 10*s.* a load, and a truss of wheat straw, worth £2. a load, and cut them together:† they made exactly twelve single bushels; or three quarters of a double quarter. A single quarter of this weighing rather more than a truss of hay.)‡

The truss of hay -	£.	0	1 11
The truss of straw - -		0	1 1
	£.	0	3 0

This, therefore, costs just 4*s.* besides cutting, 1*s.*—Together, 5*s.*

* See MIN: 125.

† A common mixture for *cut* chaff.

‡ Though the hay and the straw were both, to appearance, perfectly dry, they lost just 8 lb. in cutting! Thinking that there must be some mistake, I retried it: the result was exactly the same.

211.

PICKING STONES.

MAY 21. In future, place empty carts, in different parts of the field, to be stone-picked, for the pickers to empty their baskets into. Three men, two boys, and six horses have been two days, in collecting, and carrying off, the scattered heaps of about thirty acres: almost 1*s*. an acre;—as much as for picking.

They carried off about fifteen loads, with which the sloughs and gateways are improved; but the roads might have been equally mended, with only the trouble of emptying the carts, every night.

212.

FALLOWING.

MAY 21. We are now crossing the foul part of P. 3. balked the 21st of February,—in wet weather, when nothing else could be done.

It is a pleasure to see it break up, in clods as big as bushels: they lie so rough and

hollow, that the sun shines upon one half, and the wind blows on three fourths, of the subsoil. 212. FALLOWING.

I am fully satisfied, that balking is the best way of breaking up a summer fallow. No other method, perhaps, can give it so perfectly, the rocklike roughness, essential to a fallow.

213.

MAY 21. *In future*,—The first week in May, begin to give an eye to the wheat. M. 1. is full of Mayweed, and the wheat has got so high, it is hurtful to draw it out, notwithstanding fivebout lands are very conveniently weeded. WEEDING

The weeders, by setting one foot in, and the other out of, the interfurrow, can just reach hands, over the ridge, and have no occasion to walk among the corn. HALFROD LANDS.

It is not looking over the hedge, nor riding across the ends of the lands, but walking up or down, almost every interfurrow, which will discover whether the field is weedy or not. One plot of M. 3. is as foul as a dunghill; while other parts are as clean as a garden. WEEDING

213. But what is the use of this extra attention,
WEEDING if every part be run over by the weeders? No other than to find out which requires to be weeded, first. And this is by no means an unnecessary piece of attention. For, if the weeds are more powerful, than the corn, no time should be lost in extirpating them. But, if the corn has got the advantage of the weeds, it matters little how long they stand, so that they do not seed; nor how late the corn be weeded, so that it be not injured, by the operation. For the later it is performed, the less danger there is of fresh weeds springing up, to harm the crop, or foul the land: and the older the weeds are, the more conspicuous they become; and the higher the corn, the more power it has to smother the rising generation.

214.

SERVANTS' BOARD. JUNE 6. On the maturest calculation, I make the yearly expence of a MAN, in the house, £35. and of a BOY, £23.*

* Supposing the man's wages to be £10. and the boy's £3. a year.

214. SERVANTS' BOARD.

	£.	s.	d.
The yearly expence of a day laboring man (if he works every day) is but - - - -	27	10	0
And that of a boy, but -	18	0	0
The difference, therefore, between keeping a man in the house, and hiring one by the day, is, beside rainy days, - -	7	10	0
And the difference between a boy in the house, and one by the day, is - - - -	10	0	0

More than three fourths of a day boy's wages!

Perhaps, the farmer, who keeps no accounts, imagines he saves money, by boarding his servants, in the house: but I am confident, that, if he keeps them in the luxurious style, in which farm servants in *this* country expect to be kept, he is mistaken.*

* A man, who sits at the head of his kitchen table, may no doubt feed his men, considerably cheaper, than one who eats at a separate board; and who cannot, without many inconveniences, have farming servants in the house.

It is also to be remarked, that the above calculation was made in the neighborhood of London; where the prices of provisions are nearly the same, as in the metropolis, itself.

214. POLITICAL ŒCONOMY

Were I to reason, *politically*, it would be thus: farming servants form a large part of the community. One in the house,—one fed by his master,—*costs the community* as much, perhaps, as two, who provide for themselves: for discharge a grumbler,—one who pretends to be dissatisfied, though in fact satiated, and he will return to his bread and cheese, with, perhaps, equal health, and equal happiness. He sits down to his master's table, with a resolution to eat, voraciously, of the best,—to do himself justice; but, at his own, eats sparingly of the meanest, to save his money.

215.

LABORERS.

JUNE 15. Until this week, I have made a point of employing the neighboring cottagers, *who belong to the parish*:—because I am not fond of new faces:—because there is a satisfaction in being neighborly; and because it is but common policy, in a parishioner, to encourage the industry of his parish.

For the first ten or twelve months, I have

generally found them attentive and laborious; but after this time, they get tired of constant employment, and good usage. I have tried them all round; but have scarcely found one, whom eighteen months constant work has not made idle, insolent, or thievish. 215. LABORERS.

At present, I am resolved to give a preference to good workmanship, and low wages, only. This is the only method I can hit upon, to convince the parishioners, that industry and honesty are the only roads to constant employment. Before Christmas, I may have again the pleasure of giving wages to some of my poor industrious neighbors.

216.

JUNE 19. The clover on the hot gravels, at Adscomb, is entirely burnt up. The dry weather setting in, before the ground was covered, the moisture was presently exhausted, and the growth of the clover of course retarded. GRAVELLY SOILS.

The neighboring pieces, in the same common field, which had raygrass, and trefoil, sown with the clover, are very fine RAY-GRASS.

.216. crops: the ground was covered early, and
RAY-GRASS. the moisture retained.

Perhaps, *in future*,—upon gravel, and every other *burning* soil, sow raygrass, or any other grass which comes early in spring, among clover, and spare no expence of seed; for the thicker the plants are, the sooner the surface will be covered.

WHEAT. Last year, I sowed some wheat, on gravel, the beginning of September, and the ground was covered, before winter: there is scarcely such a piece of wheat, in the country. A neighbor sowed a clover ley, fallowed and dunged, the latter end of October; if this hot weather continue, it will scarcely be worth reaping.

BARLEY. Barley, sown the latter end of April, on gravel, is now burning. I am of opinion, had it been sown, the latter end of February, or beginning of March, it would have been a good crop. And, if the experiment on Autumn sown barley speaks truth, there is no fear of injury from frost: and another instance of the safety, at least, of sowing barley early, that sown, among the tares, in L. 1. the 16 March, is now in ear, three feet high.

217.

MOWING WEEDS.

JUNE 20. Weeds are now in their most succulent state; and, in this state, especially after they have lain a few hours to wither, I find that hungry cattle will eat, greedily, almost every species. There is scarcely a hedge border, or a nook, but what is now valuable; and it certainly must be good management, to embrace the transient opportunity; for, in a few weeks, they will become nuisances.

The margin of almost every meadow is a fringe of weeds, which if made into hay, with the rest of the field, not only spoil the stack, but fill the field, in summer, and the farmyard, in winter, with weed seeds. But, by cutting them, while succulent, cattle which go on a bare pasture, are benefited, and the fields, the stack, and the farmyard, left uncumbered; beside a fresh swath of nutritious herbage (if the weeds be cut early enough) ready to be mown with the rest of the field.

217. July, 1777. "This has already been said."
MOWING WEEDS. It is true,—and probably will be repeated. Useful knowledge should be seen, in every point of view.

218.

TARE HERBAGE. JULY 10. Ten cart horses have eaten twentysix rods of very good winter tares (nearly as good as some I am selling for £8. an acre) in two nights:—which at £8. an acre, is five shillings a day,—five and thirty shillings, a team, a week, for tares alone; beside corn and chaff.

CART HORSE KEEP. A stallion, intended to be cut in a few days, has eaten nothing but tares, for the week past.—He has worked hard, every day, and I think he improves, both in condition and vigor: therefore,

In future, allow cart horses very little corn, with tares.

219.

TIME of SOWING. JULY 10. There is a disadvantage attends early sowing. The wheat, sown in August, and the barley, in September, are eaten up,

by small birds of every denomination. 219.
These being the only crops, in the country, TIME of SOWING.
fit to be eaten, all the birds, in the country, are collected together, to eat them. Had they been sown with the other crops of the neighborhood, they would have had neighbors' fare.

But who would not sow wheat, early, to get straw, six feet high, when straw sells for 15*d.* a truss? And who would not prefer an ear, five inches long, to one not more than two inches?

The most mischievous of birds are sparrows. SPARROWS.
Were all the farmers of a neighborhood to agree in their destruction, by offering rewards for their heads, their number might be lessened. Were the pratice general, surely the whole race might be extirpated.

Is not the destruction of the destroyers of human food an object of the legislature?

I should suppose that 6*d.* a dozen the first year, a shilling the next, and half a crown for the third year, would nearly reach extirpation.

How soon twelve sparrows destroy twelve penny worth of wheat! Were farmers

219. unanimous, it would certainly be worth their while to give twice twelve pence, a dozen, to have them destroyed.*

220.

SOWING TURNEPS.

JULY 12. Hand-raked in the turnep seed, sown on S. 3. the expence about 2s. an acre. Ridding the surface, of a quantity of dead couch, is nearly worth the money, to the first hoing.

SEMI-CULTURE.

Were I to sow fifty acres of turneps, yearly, I am led to believe, from this essay, that I should hand-rake them in, though the surface were perfectly clear from weeds, or other obstruction of the hoe.

The finest harrows do not give that evenly pulverous surface, nor bury the seed at that desirable depth, which a hand-rake does.

* The Island of Bermuda was so much pestered with Red-birds (originally brought there as curiosities from the Continent of America) that an Act of Assembly was thought necessary to decrease their number;—and it had the desired effect.

JAN: 1799. The reduction of SPARROWS, as of RATS, is a *county* concern. See SOUTH: COUNTIES.

A fine surface, free from obstructions, might be raked for a shilling, an acre. If the surface be foul, it is raked of course; if partially foul, it is very little more trouble to give it a general, than a partial raking. Women, with common hay rakes, are equal to this work. 220. SEMI-CULTURE.

221.

JULY 15. I have waited, a fortnight, for a fine day, to get in a barley stack. It was a large stack, and if one of the very heavy showers, which have fallen so plentifully of late, had taken it, in its full width, the damage must have been considerable. HOUSING STACKS.

It was necessary that this stack should be in the barn; yet it never occurred to me, until last night, that it might be taken in, any day, without much risk.

Instead of exposing the whole, at once, I took it down, IN PARTS. I first unthatched about one third, and cut this down to the frame. Just as this was got into the barn, a shower fell; the men went to breakfast, and all was safe. It cleared up, and another part was unthatched. Another shower came,

221. HOUSING STACKS. before this part was in; but it was purposely to leeward of the part still standing, and was easily defended by the thatch already taken off. It turned out a fine afternoon, and the whole was got in, in three *cuts*, without the least damage. The expence of cutting was about eighteen pence: not a penny, a load.

222.

RE-LOADING HAY. JULY 18. (Thursday). On Tuesday evening, the hay of K. 2. which had been cut, almost a fortnight, was in tolerable order; and the sap being nearly exhausted, I was unwilling to expose it, any longer, in this critical state: I therefore put it upon the waggons, to keep it out of harm's way; but did not unload it.

Yesterday, unloaded one load, *very gently*, and left it untrodden. Upon the emptied waggon, *re-loaded* another, which stood in the field. The wind was high, and the sun hot. Two men reloaded it, very deliberately; breaking every lump, and loading it lightly, with a fork: they were three or four hours in doing it. It was unloaded, today, in good

order. Re-loaded another, today, which will be unloaded tomorrow. 222.

RE-LOADING HAY.

By thus exposing it to the sun and wind, and by leaving it on the stack for four and twenty hours, untrodden, it is got from *tolerable* into *very good* order.

Because hay, which has been long cut, and whose juices are exhausted, is loaded upon *carriages*, to prevent its being totally spoiled; it surely does not follow, that it should be hurried into *stack*, wet or dry.

Suppose one load takes two men, three hours and a half, two men would re-load three loads, a day: about 13*d*½. a load. Ten times 13*d*½. is not equivalent to the difference between good hay and bad.

Re-making, in large *cocks*, may help hay which is under-made; but a cock cannot be drawn into a barn, or under a shed, as a cart or a waggon.

MAKING MINUTES.

WHEN I began to make the preceding Minute, I merely meant to register facts, that I might not, *in future*, put hay into stack, before it be *thoroughly* made; and I am of opinion, that had not the former part

222. of the Minute been made, the latter, nor
MAKING MINUTES. the calculation, would have occurred.

This is an evidence in favor of RECORDING FACTS. Before an *intelligible* Minute can be made, ideas must be collected and arranged,—the intellect exerted. This adduces, to the mind, the whole chain of recollectable *facts*, as well as *words*, incident to the subject. From these, new ideas spontaneously generate; calculations and plans of future management present themselves; and thus, from ASSOCIATED FACTS, the mind is led to INFERENCES.

GENERAL REMARK. IF recording our ideas be found serviceable, to so humble a subject as haymaking, surely it would be beneficial, to the more abstruse branches of science. How many VALUABLE IDEAS have slid away, which a Minute might have rescued from oblivion; and how many useful truths, might, by thus drawing inferences from incidental facts, have entered within the pale of human knowledge.

Perhaps, generally,—habituating ourselves, to register our ideas, teaches us to think closely, and systematically.

223.

223.

JULY 21. The oats of O. 2. are so exceedingly full of seed weeds, it would be labor lost, to attempt to hoe, or to weed them; and of course, unpardonable, to let them stand for a crop. FAILING CROPS.

I had determined to plow in the oats and weeds, together, and sow turneps on the one plowing; but on a narrower inspection, I find there are a sufficiency of clover plants, to furnish a crop; I therefore mow the oats and weeds, for the cows: by which means the weeds, being chiefly annuals, are destroyed, and the clover has an opportunity of exerting itself.

But what could give this astonishing abundance of seed weeds? I apprehend fine tillage, and deep plowing. TILLAGE.

This little field is a deep, friable loam. It was winter fallowed, for spring corn and clover. The last plowing, but one, was from ten to twelve inches deep, and much fresh earth was brought up. This fresh

223. TILLAGE. earth was plowed, and oats and clover sown over it.

The weed seeds had, for generations, been trodden into the substratum, where they had lain, till this deep plowing exposed them to the atmosphere.

DEEP PLOWING. What is to be learnt from this? Is deep plowing bad management, generally? No; I apprehend not.—But, perhaps, deep plowing, *for a crop*, and *without dung*, is very bad management. And this accounts for the disrepute, in which deep plowing is held, by most common farmers.

Perhaps, deep plowing, *for a crop*, even *with dung*, is bad management; for, it is probable, a great number of seed weeds will follow; and the crop, if not totally spoiled, will be greatly injured; and, perhaps, the best way of increasing the quantity of corn mold is this:

Plow shallow,—no deeper than the plow has usually gone,—until the root weeds are destroyed, and the weed seeds have spent themselves; and, then, *by one deep plowing*, fetch up a sufficient supply of fresh mold. On this fresh, *rough* surface lay a sprinkling of dung;—harrow it well in, and let the

seed weeds, which are lodged near the surface, vegetate—gather it up, *shallow*, into fivebout lands; and harrow it, as fine as a garden. At seedtime, reverse the lands, and plow, *moderately deep*, for a crop. 223. DEEP PLOWING.

This I am practising, on L. 1. and P. 3. Attend to the effect.

JULY, 1777. The effect far exceeded the Writer's expectations. The crops were so rank, in both instances, that the heavy rains of this summer have beaten the wheat, flat to the ground. There are from three to four harvest load, an acre. MELIORATION of SOILS.

JANUARY, 1799. This proves, sufficiently, the justness of the theory: and further experience has fully established the principle. See WEST OF ENGLAND, MIN: 17. for an instance of this practice.

224.

JULY 21. Reaped the autumn sown barley, on Friday, the 19th. But it had stood three or four days too long. The crop was very even, and as good as could be expected, from the quality, and state of the soil. BARLEY.

224. That which was exposed to the frost, was
BARLEY. obviously the best; but I am at a loss how to account for this circumstance. Perhaps, the roots, of some large elms, which grow in the adjoining hedge, impoverished the soil. But this is mere conjecture: the contiguous tares are not the worse for them.

I do not see why barley should not be sown on land which is perfectly clean, in autumn, and be reaped, in the vacation, between haytime and wheat harvest.

225.

PLANTING CABBAGES. JULY 21. Finished planting, yesterday. The ground was so firmly consolidated, by rolling, that it was laborious to make the holes, with a *hand* dibble. I therefore converted a potatoe dibble, into a cabbage *foot* dibble, which answered beyond expectation.

To regulate the distance, in the rows, untwisted a garden line, at every two feet, and inserted a feather, of two or three inches long. A line of 200 feet long was prepared in a few minutes: and, though it has been out, wet and dry, not a feather is displaced.

To regulate the distance, between the rows, fixed a line, with three feathers, across each end of the fivebout bed to be planted; bringing the middle feather, exactly, into the middle of the bed. 225. PLANTING CABBAGES.

An acre and 5-8ths took about 13,000 plants, or 8,000 plants, an acre.

226.

JULY 31. Cut the autumn-sown oats, today: but I began likewise to cut wheat. Therefore, autumn-sown oats are not so eligible, as autumn-sown barley, (see the 21st.) which would be got out of the way, before wheat harvest. OATS.

Some oats, sown the 11 March, will be ripe in a few days. But these are on gravel, those on loam. I should suppose that oats sown, in September, would come earlier, than oats sown, in March, on the same soil, by a week or ten days, but not more.

They are a very good crop, and very well "hawed" (eared—*panicled*.) The straw is long and reedy; and a few, to be thrashed out for thatch, would be very convenient.

226.

227.

MAKING TARE HAY.

AUGUST 1. I do not see any material improvement of the process, I have hit upon, this year, of making tare hay.

Broke the swaths, into *wads*, or small bundles, after the mowers; but instead of leaving them, indiscriminately, on the ridge, or in the furrow, and rolled up in hard lumps, I shook them up, light, and set them, in rows, on the sun side of the ridges.* If one row could not contain them, set them, a-zig-zag; endeavoring, as much as possible, to make each wad resemble, in shape, the bee hive. By thus standing light, and open, upon the ridges, I apprehend, they made, in much less time, than they would have done, in hard bundles, in or near the furrows. I did not wait, to let them wither, but followed the mowers, immediately.

After a shower (as soon as the ground, and the outsides of the wads, were dry,)

* See MIDLAND COUNTIES; where this is an ancient practice, in the common field husbandry.

turned them over, upon fresh ground; and, by one smart shake, with a prong, lightened them up, as before. The first two acres had a whole day's rain upon them; but, I apprehend, they are very little worse for it. 227. MAKING TARE HAY.

Those mown, since the rains, have had nothing done to them, but the first operation, and one turning, when the first upper sides were made: they did not cost sixpence, an acre, for making.

The popular idea, respecting tare hay, seems to be this: if the weather *happen* to be fine, the fodder is incomparable; but one shower of rain sends it to the dunghill.

I am convinced, however, from this year's experience, that, if tares are cut, at a proper age (while the under pods are filling, and the halm still green at the bottom) it is not a shower, that will hurt them, nor a whole day's rain, that will spoil them. And I am of opinion, that, with proper management, nothing, but a fortnight or three weeks rain, can fit them for the dunghill: and, perhaps, the *chance* is ten to one, that such weather does not happen, in July: and, *in future*, I will calculate, that it is

227. ten to one, I get my tare hay, in tolerable order.

228.

BRINING SEED WHEAT. AUGUST 4. The seed wheat of C. 1. was all steeped, in salted limewater, except one corner, sown dry.

Today, I have been attending to the result; but cannot perceive any difference in the crop: indeed, there is scarcely an ear of smut, in the whole field. Am I to conclude from this, generally, that preparing seed wheat is unserviceable? by no means. It had not, in this experiment, an opportunity of proving its utility; because, there being no smut, no *comparison* could be made. It is therefore a blank experiment.

But what produced this crop, so free from smut? A summer fallow, without dung.

A barley stubble, dunged, and sown with wheat (by Farmer ——) on one plowing, has produced almost as many smutty as sound ears!

229.

PEAS and BEANS.

AUGUST 7. This year, I sowed part of a field of SANDY LOAM with grey peas, alone, and part with peas, and mazagan beans, mixed. The peas came up best, and looked best, through the spring. But the BLENDINGS* are, now, much the best crop. The clean peas are drawn into the ground, by weeds; those among the beans scarcely touch it,—seem to be much better podded, —and are cut more easily.

The mixture was two bushels of peas, to one of beans; the quantity, about four bushels of this mixture, an acre.

Common horse beans would not do so well; they would come too backward, and would not be so readily parted from the peas, as mazagans are.†

JULY, 1777. This year, the Writer repeated the experiment, on a GRAVELLY LOAM. The result differed from that of last year: there was no apparent advantage in

* See Provincialisms of YORKSHIRE.

† A sort of small garden bean.

229. the crop; and the peas, if either, left the cleanest stubble.

230.

TARE-BARLEY. AUGUST 8. The *middle of March*, mixed an equal quantity of tares and barley, and sowed about two bushels and a half of the mixture, an acre, on different soils.

Just when it was ready to cut, *for hay*, we were busy cutting the meadows, and mix grass leys; and the *barley* being remarkably fine, on every soil, I determined to let it stand, for *corn*: the tare herbage to go among the barley straw, for fodder.

The day before yesterday, we began to cut. The largeness of the heads, and the plumpness of the grains of barley, is striking; and the tare herbage is in the state, in which one would wish to cut it.

If it be well got, there will be from two to three quarters of barley, and a load and a half of very good *straw hay*, an acre.

231.

AUGUST 13. Of fiftythree acres of wheat, this year, two are very bad, fortyeight middling or good, and three are very good. What was the management? WHEAT, 1776.

The very bad—not a quarter an acre—is after beans, after oats, on an *old ley*. The beans were drilled; but the soil was too *couchy* to be kept clean by *boing*. The wheat was sown over one plowing, without manure; I depended on the *freshness* of the mold.

What can be drawn from this, except that from bad tillage come bad crops? Perhaps, had this ground been summerfallowed, or, instead of horse beans, it had had a crop of tare herbage, and a midsummer fallow, the crop of wheat would have been much better: for, throughout the crop, *the produce is nearly in proportion, to the number of plowings.* TILLAGE.

The very good is after a *deep* summer fallow, with an immense crop of turneps and charlock, plowed in, by the last plow-

231. TILLAGE. ing; on the fresh plit of which, the seed was sown, and harrowed in, as fine as a garden.

PLOWING IN HERBAGE. It is uncertain when this field was manured: not within three or four years, at least. The last crop was barley. The *fallow*, it is true, was exceedingly fine; but I am of opinion, that the *herbage*, buried in it, assisted, much, in giving the abundant crop.

232.

BEANS. AUGUST 15. After being at the expence of carrying off the crop, to an adjoining meadow, we were able to get the plow into the *bean* stubble, today.

TARE HAY. A *tare hay* stubble has been balked, and crossed, and now lies as fine a fallow,—as rough and as promising,—as can be wished for.

FALLOW CROPS. What an advantage here appears, on the side of TARE HERBAGE, as a FALLOW CROP! Had not the beans been carried off, the plow would have been stopped, ten days, or a fortnight, longer.

The removal, therefore, is obviously

good: I calculate the expence at about half a crown, an acre;—but the crop was not large. 232.

233.

AUGUST 16. The experiment in M. 1. (See 24 March) stands, now, as it did then: —That which laid without harrowing, after plowing in the seed, is the worst; that plowed in, and afterwards harrowed, the next; that harrowed, fluted, harrowed, the cleanest, and thickest crop. SOWING WHEAT.

But I do not attribute this superiority, so much, to the effect of the fluting, as to the *tillage*, it thereby received. The soil (a gravelly loam) was *sub-plowed*, after peas, cleansed, well dunged, and the wheat plowed in, by *one turn-plowing*. I am firmly of opinion, had it been turned, thrice, instead of once, there would have been two quarters of wheat, more, an acre. TILLAGE.

On that which cost £ 2. 9*s.* an acre in tillage (see 20 Oct.), there cannot be less than four quarters an acre; on this, which cost but 12*s.* 10*d.* an acre, in tillage, there are not two quarters. But this does not SUB-PLOWING

233. lessen the merit of SUB-PLOWING *to disengage the surface weeds.* In this point of view, I am clear that it is excellent; but it will not serve as a substitute for repeated TURNINGS, and EXPOSURE of fresh surfaces.

SUB-PLOWING.

MANURING. But, perhaps, this disparity of crop does not rest, wholly, on tillage; but jointly on this, and the mode of dunging. The dung, which gave the good crop, was laid on, for the preceding crop of peas, and was, of course, *thoroughly incorporated with the soil,* by the midsummer fallow, which succeeded. That which gives the bad crop (fine spit dung) was (in the usual way) *buried in raw lumps,* with the seed.

VEGETABLE ECONOMY This is another proof of the fixidity of vegetable food (see 13 July, 1775). For though the former was exposed, and re-exposed, to the intense heat of last summer's sun, it gives a crop of four quarters of wheat, an acre. It also shows, that manure should be incorporated with the inert particles of the soil, together forming one chyle, before it be in the fittest state for the nourishment of the vegetable; for that which was plowed in, with the seed, in large lumps, was better dung, in greater quantity, and

had not been exhausted by a preceding crop. 233.

A further evidence, in favor of tillage, occurs in B. 3. a stiff clay, which was, last autumn, sown with wheat. It had been fallowed, two years, and was brought to an exceedingly fine tilth. Part of it was dunged; part sooted; and part undressed. TILLAGE.

The dunged part looked best, in winter; the sooted, never shewed itself; and the only difference, which now appears, is, that a part of the undressed is much the best crop; and, I recollect, this part was the best fallow.

BUT let not these instances, in favor of *tillage*, and *herbaceous melioration* (see 13th) fix in me one idea, to the prejudice of DUNG, or other ADVENTITIOUS MELIORATION. MELIORATIONS of ARABLE LANDS.

Tillage may give one, perhaps two, or more crops, in proportion to the latent food; and an herbaceous dressing may give two, perhaps three, or more, in proportion to the quantity (and perhaps to the quality) of the herbage plowed in; but the soil, in both cases, will be exhausted, in proportion to the quantity and the quality of the produce,

233. MELIORATIONS of ARABLE LANDS.

carried off; and, if not replenished with ADVENTITIOUS ALIMENT, it must, sooner or later, be reduced to a state of poverty.

If the soil be exhausted, by repeatedly carrying off the produce; nothing but repeated INHAUSTIONS, nothing but dung, or other EXTRANEOUS FOOD, repeatedly incorporated with the soil, can preserve it in PERPETUAL VIGOR.

This needs not a perhaps: the experience of ages,—the experience of every day, confirms it.*

Therefore, perhaps, to force, to exhaust, to impoverish a soil, get it into exceedingly fine tilth,—sow it with the vegetable it most affects:—the herbage in full sap, turn it under; crop, and repeatedly till, until its treasures are exhausted.

And, perhaps, to favor, to inhaust, to enrich a soil, be sparing of tillage, and profuse of manure.

But, perhaps, to preserve land in perpetual vigor, to keep it in a state of perpetual opulence, to enable it to throw out, and

* I am speaking, here, more particularly, of *arable* lands.

mature, an abundant produce, annually, be not sparing of manure, nor tillage. 233. MELIORATIONS of ARABLE LANDS.

JANUARY, 1799. I let this Minute stand, nearly in its original form, that it may promote the further discussion of a subject, which, though it has recently had much scientific attention paid to it, still remains involved, in the same cloud that covered it, when this Minute was originally written.

234.

AUGUST 17. High fences are nuisances of arable land. FENCES of ARABLE FIELDS.

This fact is particularly obvious, at present. The corn of narrow close fields, and every where under high trees, is, by the many heavy rains, very much lodged; and in some places, grown through, by weeds: while, in large open fields, or where the hedges are low, very little damage is done.

But, at present, I feel their inconveniency, still more sensibly. We carried the *middle* of H. 1. (wheat) the day before yesterday, in good order; but about a load, *under a high quick hedge*, was still damp; and was

234. FENCES of ARABLE FIELDS.

obliged to be left, in the field. Yesterday, some of the sheaves were opened, to give them air;—a heavy squall came on, before they could be re-set up, and they are, now, growing into mats, as they lie on the ground. Had it not been for the *high hedge*, it would *all* have been safe in the barn.

I would not wish to see the fence of an arable field, above four feet high. Perhaps, a good ditch, with a pruned quick hedge, about that height, is preferable to any other fence.

The oats of A. under a high thick hedge, are mere dung; under one, which was cut down last year, to about four feet high, they are very little the worse for the weather.*

235.

HOING INTER-FURROWS of WHEAT.

AUGUST 17. See 16 May, 1775. I never conceived better theory, than that. For though, last year, it was rather detrimental than serviceable (the mold not being thrown back to the roots of the corn, the plants, as

* For further evidence, on this subject, see MIDLAND COUNTIES, MIN: 160, 161, &c.

they grew heavy, fell into the intervals) it is fully confirmed, in almost every instance, this year, in M. 1. 235. HOING INTER-FURROWS of WHEAT.

The wheat was sown, on high, backed up, fivebout lands; the interfurrows were of course deep, and the plow reaching the inert subsoil, there was a space of two feet wide, between each bed, without a blade of wheat in it.

There was, of course, no backward puny ears, in the interfurrows. It was full of mayweed; but, by setting one foot, in the interval, and the other, among the corn, it was drawn out, without injury to the wheat, and thrown into the intervals. The straw is singularly bright; — not a speck upon it. Crops, not half so rank as this, are almost everywhere, more or less lodged: — this has scarcely a broken straw in it: — a more beautiful crop never grew. An old reaper, — a man upwards of threescore, — declares, that he never reaped wheat so heavy in the sheaf: the grain is plump and large, beyond any I have seen.

All these advantages, however, are not wholly owing to an interval of two feet being, accidentally, between each ridge;

235. though, perhaps, these intervals aided, in every instance. This is the piece mentioned in a Minute of yesterday, and the management of this piece is worth copying in future

HOING INTERFURROWS of WHEAT.

ARABLE RIDGES.

Perhaps, the height and narrowness of the ridges are other reasons of its not lodging. The rod-wide, flat beds, of Barn Field, were many of them lodged. But this always happened, in the middles of the lands,—never against the interfurrows; which were in the identical predicament of those mentioned above.

The high, round lands of M. 3. it is true, are lodged; but they are lodged chiefly in the interfurrows, which are full of a slender, puny crop; and M. 3. is a good evidence, in favor of HORSE-HOING INTERFURROWS.*

236.

HARVESTING WHEAT.

AUGUST 18. See MIN: 234. It is dangerous to open wheat, that has been wetted in shuck. The sheaves, which were left

* For experience in tilling the interfurrows of TURNEPS, see MID: COUNT: MIN: 87.

standing, are still safe; those which were opened and caught in the squall, are much grown. But this is a great deal owing to the wheat's being spread *too thick* upon the ground. For, last night, I experimentally spread a part of it *very thin*:—this morning, it is in good order. 236. HARVESTING WHEAT.

But why was this wheat opened? Because it was growing in the band places, as it stood in the shucks. But is there no way of drying the band places, without the risk of opening? A much safer, and one fully as effectual, never occurred to me, till last night. After having spread a few sheaves, thin, as abovementioned, I set up half a dozen, in the usual manner in which barley and oats are harvested, in the North of England;* instead of tying the band, hard, at a foot from the buts, I tied it, loosely, about the same distance from the tips; and, spreading the buts, set them up, singly; in resemblance of sugar loaves, or fish pots; leaving the insides hollow. This morning, they were nearly as dry, as that spread thin. I shifted the bands, back

* See YORKSHIRE; also MIDLAND COUNTIES, on this practice.

236. again, to the common binding places, and opened the ears: they were presently dry.

HARVESTING WHEAT.

If wheat, which is wholly wet, can be thus dried without risk (for, in case of rain, it is much safer in singlets, than even in shucks), certainly, that partially wet, in the band places, might be dried, with the same safety, and less trouble. And, at present, I am determined not to open wheat; for there is no guarding against a squall.

I have, this year, observed in general, that the small, loosely tied sheaves were dry, while the large, hard tied ones, of the same shuck, were growing; that the ears of the bands were the first that grew; and that those shucks, which stood free and open, fared better, than those whose sheaves stood *crowded* together, in a close lump, through which no air, nor sun, could penetrate.

In future,—see that the sheaves are not tied too tight;* that they be not made too large; that they be set up in such a manner, as but just to touch each other, at the

* But the opposite extreme must be guarded against; for if they be tied, too loosely, there is danger of their slipping wholly out of their bands; besides their being difficult to load, and worse to stack.

buts and ears, leaving the space of a foot or more, between sheaf and sheaf, at the band place; and that the ears of the bands be turned inward. 236. HARVESTING WHEAT.

Perhaps, reaping, by the shuck, would be the fairest, and safest way of reaping wheat;* or, by the acre and shuck, jointly.

237.

AUGUST 21. I never made a better days-work, than I have done, today;—through the means of omnipotent bribery. MAN: of SERVANTS.

Last night, after a hard dayswork, I gave the men as much ale as they would drink. This morning, after they had unloaded the waggons, ordered them two gallons, to their breakfasts; which I desired them to eat, while the horses were feeding. The teams were presently out;—the men went singing into the field; and, working like coal heavers, never looked behind them, until we had made a stack of wheat, of

* I knew not, when this theory was noted, that it formed part of the established practice of the MIDLAND COUNTIES.

237. twenty loads: it was run up, in about five hours.

MAN: of SERVANTS. I now repeated the dose; and, in the afternoon, we gathered up as many odds and ends, as, without the ale, would have amounted to a dayswork.

This evening, I have been *canvassing* for a great dayswork, tomorrow.

HARVEST MAN: But all this ale must cost something: the maltman's bill will come in at Christmas. Very true.—Let me calculate—three gallons, last night, two this morning, and two at noon, are seven gallons; which, at 6*d.* a gallon, is 3*s.* 6*d.*—or nothing, when divided among ten men and two boys: it is but 6*d.* more than *one* man's wages. *Five* men would not have done, more, than the seven gallons of ale; nor would the satisfaction of seeing men work, cheerfully, have been enjoyed.

238.

HARVESTING BARLEY. AUGUST 22. The *tare barley* (see the 8th) was cut, before it was quite ripe. The grain was remarkably fine, *before* cutting; but it is, *now*, a shrivelled, unsightly sample.

—It has not kept its body, like wheat, or oats, cut green; beside, it had been cut down, a fortnight, before the sap was sufficiently out of it, to be carried. 238. HARVESTING BARLEY.

The barley of N. 6. was *quite ripe*, when cut: It is a beautiful sample; and was ready to carry, the day after cutting.

The difficulty in harvesting barley, lies in preserving its color, and preventing its growing. There is no fear of its shedding; and it must be very ripe and dry indeed, if the ears break off. Is it not, therefore, evident, that, to cut barley, before it be quite ripe, is bad management? If it be free from weeds, and is a standing crop, surely it must be good management, to let it stand, until it can be cut, one day, and carried the next. The risk of the weather—and this is the only risk,—would be almost evaded. But see MIN: 245.

239.

AUGUST 24. Last autumn, I again sowed a plot, experimentally, with the blighted spring wheat of 1774. (See 21 August, 1775.) It did not only vegetate, but the SEED WHEAT.

239. SEED WHEAT.

crop, is equal to the richness of the soil, and the grain a very good sample.

This shows the eligibility of sowing wheat, in autumn; and, as far as these experiments go, evidences the impropriety of choosing the largest, finest, plumpest wheat, for seed.

I apprehend, that one bushel and a half, of the shrivelled trash, in question, contains as many grains,—would give as many plants,—would seed an acre of ground, equally as well, as three bushels of large, full grained wheat. But this is only one advantage; its value was trifling; it was not worth a shilling, a bushel.

I have still a little left;—for I know no use it is fit for,—and I mean to give it another trial, at three years old.

JULY, 1777. It was sown, in September, but never came up.

The Writer blamed the strength of the pickle, in which it was steeped: this, however, was but conjecture. The fact is, that it was brined, limed, and sown, in the same manner as the rest of the seed, sown in the same field; but not one blade appeared.

240.

AUGUST 24. The autumn-sown beans were cut, about ten days ago. We were cutting mazagans, sown in February, at the same time: therefore, the common horse bean, sown in September, comes as early as the mazagan, sown in February. The few which escaped, were well podded; and, had they happened to have been all covered by the snow, would have been a very good crop. BEANS.

241.

AUGUST 24. By a continuance of wet weather, the spring crops were all cut, before any of them were carried;—hands, of course, became scarce, and invaluable. I was glad to get the major part out of the weather's way, as fast as possible. Therefore, instead of cocking and raking, I cocked and carried, without losing time by raking. HARVESTING LOOSE CORN.

241. There were several attendant advantages: I got more corn together, in the same time, with the same force, than I should have done, if the ground had been raked,—first after the cockers, and then after the waggons. By raking it, once, with five-foot drag-rakes, it was raked at a much less expence, than it would have been, by raking it, twice, with the common hand-rake. By raking it, after a shower, or in the morning dew, it raked cleaner, and less grain was shed. By raking in, or immediately after, rain, the men were employed, when otherwise, they would have been useless.

HARVESTING LOOSE CORN.

Why not practise this, generally? I see but two reasons, why I should not: the feet of the horses, and wheels of the carriages, waste a part, by pressing it into the ground; and the trouble of going twice over the field, to pick up the crop, is incurred.

In future,—if work be more plentiful than workmen, or the corn be in great danger from the weather, cock and carry; if the reverse, rake before and after carrying.

242.

AUGUST 28. Some overflowings of clover, I ordered to be made into a square stacklet for the cart horses. There was more than the stacker was aware of: he made his bottom small, and was obliged to carry up his stem very high, to get it all on. It looked aukwardly tall and top-heavy, while it was in making; but, after the roof was on, and thatched, and the stem was settled, it became one of the most elegant little stacks I have seen. STACK-MAKING.

A tare-hay stack, and a meadow-hay stack, which stood in the same yard, and which were made in the common way, of beginning to draw in, as soon as the stem is of a moderate height, *before settling*, look frightful in the company of this. They are all roof and eaves, which over-shoot so much, and hang so low, they almost hide the stem; and the roofs are so flat, there is barely a descent for rain water.

I took the hint, and have since built two wheat stacks, a tare-barley stack, an oat

242. stack, and a bean stack, after this chance-
STACK-MAKING. produced model; and, in my eye, they are all elegant.

But their merit lies not, wholly, in appearances; they take less thatch and thatching, and are more secure from the weather, than pot-bellied, flat-roofed stacks.

Stack-making did not appear an object of attention, until this year; nor, indeed, is it, compared with the cleaning of land, and getting a farm into order. To get clean and good crops, is the first object; the economy of a stackyard, is but secondary: indeed, until those are had, the art of stack-making can be but little practised.

As I have this year studied the science, I cannot say practised the art, of stack-making, I will minute what I have discovered, and lay a foundation for my next year's researches.

Which are the handsomest? The two wheat, and the tare barley.

The wheat stack, which stands on a frame of eighteen feet square, contains just twenty loads: it has something less than fourteen, in its stem, and rather more than six, in the roof. Except a protuberance

at one end,—but this falls on the execution, not the design,—it is very complete. 242. STACK-MAKING.

The wheat stack, raised on the platform, stands on a bottom of fifteen feet, by nineteen and a half, and contains eighteen loads: there is about twelve in the stem, and six in the roof. This is a very well formed stack.

The tare-barley is a little stack, on the ground, of about twelve loads: it stands on fifteen, by eighteen; its eaves are nine, and its ridge eighteen feet, from the ground; (but I do not recollect how many loads there are in the stem, nor how many in the roof). This, in design and execution, excels them all.

Which is the least handsome? The bean stack. Why? because the stem and the roof are out of proportion, and the base is too large. It stands on fifteen, by sixteen and a half;—has more than seven loads in the stem, and less than three in the roof: it is, of course, too low, squat, and lumpish.

The oats were long, and had been ravelled by the weather; they were bad to stack: the stack-maker could not keep the stem upright. The stack has, of course, too

242. much *belly*,—its appearance is heavy;—it
STACK-MAKING. wants the lightness of the wheat, and the neatness of the tare barley.

Have I been able to draw any GENERAL RULES, worth remembering? I think I have.

A square, not a circle, nor a parallelogram, is the best form of a stack frame, or basement. Perhaps, a stack, built on this figure, is more pleasing to the eye, takes less thatch, and stands firmer, taken jointly, than on any other.

The stem should be carried up, as plumb as possible (except the last course, which should project five or six inches, to form the eaves); for the weight of the roof will press out the upper part of the stem, sufficiently. If it be overhung, *in making*, its own weight, and the weight of the roof will squeeze it too flat,—will spoil its appearance, and waste both thatch and thatching.*

The stem should contain about two thirds, and the roof about one third, of the whole stack. If it be built, on a frame, the

* This applies better to a hay stack, than a corn stack; especially one formed of sheaves; which do not settle so much, as hay or loose corn, and ought to be *somewhat laid out, in making*.

stem should contain less, and the roof more; if on a bottom, the reverse.* 242. STACK-MAKING.

The corners of the stem should not be built, too sharp;—should be carried up snug:—the sides will look fuller, and the swell, given by the pressure, will be more perceptible.

The ends of the roof should have a gentle projecture, answerable to the stem; and the sides should be carried up convex, rather than flat, or concave. Perhaps, a roof, gently convex, shoots off rain water, preferably to any other.

I am quite pleased with the proportion of the tare-barley stack; its height is exactly equal to its length, and to its width at the eaves, and exactly double the perpendicular height of the eaves. Therefore, the superficies of the end of the roof is eighty-one square feet, and that of the end of the stem 148.5.

If the sides were upright, it would have been just double the end of the roof, and this, of course, one third of the whole; but the superior pressure on the stem, more than makes up for the deficiency of dimension;

* But see the WEST OF ENGLAND, on this point.

1812. STACK-MAKING. and this is the reason why the roof does not take one third of the whole quantity, when the stack is built from the ground.

As the width of the platforms of the stackyard (see PLATE I.) is but eighteen feet, and the roads round them, but just wide enough for a large load, a stack, wider than eighteen feet, is inconvenient. *In future*, therefore, I will endeavor to make them, as nearly as possible, to the above dimensions, and make their length proportionate to the number of loads; ten loads will stand on a square; twenty, on fifteen by thirty.

I do not wish to make a stack, much larger, than twenty loads; especially a corn stack. The risk of making, and getting in, is much less, on a small, than on a large stack. A large stack does not settle, so truly, as a small one, and, of course, will not stand the weather so well. A large stack, it is true, takes proportionably less thatch, and thatching; and this seems to be its only preference.

I find that one of the platforms is more than eighteen—is twenty feet wide; therefore, place the larger on this, the smaller

on that. What will be the proportion on this? Five sixths of twenty are 16.666, &c. say $16\frac{1}{2}$ feet; therefore the bottom will be $16\frac{1}{2}$; the width and height 20. 242. STACK MAKING.

The twelve loads of tare barley contain 4131 cubical feet, or 344.3 cubical feet, a load.

The superficies of the end of the smaller dimensions, is 229.5; that of the end of the larger scale, 282.5.

Therefore, every foot and a half, in length, of that, and every foot and a quarter, of this, will hold a load of corn, or of hay which does not heat much: consequently, a bottom, for any number of loads, may be readily set out, with mathematical certainty.

JANUARY, 1799. I let these calculations stand, entire: for, although the application is local, the principle, on which they are made, is general, and may be applied to any given situation.

243.

CULTURE of CABBAGES.

AUGUST 31. See 21 JULY. Part were planted with intervals of two feet in width, part with those of two feet and a half.

Two feet intervals are too narrow;—there is not room for the double plow to pass between the cabbages, without injury, when they are in the state fit to be molded up.

If the furrow intervals are sufficiently wide, to keep them dry, in winter, thirty inch intervals between the rows, are much preferable to those of twentyfour.

JULY, 1777. The furrow intervals *are* sufficiently wide, to keep them dry in winter. And the Writer apprehends, that three rows of cabbages, on a half rod bed, with thirty-inch intervals, between the rows, leaving thirtynine inches, for the furrow intervals, is an eligible way of planting farm cabbages, on wet land.

JAN: 1799. If, however, the soil be *rich*, and the cabbages of a *very large* sort, still wider intervals might be found more eli-

gible. See MIDLAND COUNTIES. Art: CABBAGES. 243. CULTURE of CABBAGES.

In the above method, however, the furrow intervals give freedom to the two outside rows: so that, on the whole, it appears to be unobjectionable.

244.

SEPTEMBER 2. The HARVEST MONTH* ended, last Saturday, the 31st. GENERAL ECONOMY of HARVEST.

I had, this year, seven month men and two boys; and two men in the house: in all, nine men and two boys, by the month, or the year. But I was two or three men short. Ten men, two boys, and three teams, are a set for carrying, if the distance be less than half a mile; if more, four teams, and of course eleven men are necessary.

* It is an established custom, here, for every man, in harvest, to work by the *acre*, or by the *month*; not by the *day*. If a laborer be employed, constantly through the year, he expects, during harvest, to be constantly employed on mowing, reaping, &c. by the acre, or to have his harvest month; that is, to have an advance of wages, (to about 3*s*. a day) certain, wet, or dry, during one month; which month commences when it best suits his employer.

244. GENERAL ECONOMY of HARVEST. Month men are very convenient; they are always at command, in cases of emergency; and nothing but a continuance of rain, while the barns are empty, can make them burdensome: and, *in future*, I will endeavor to have not less than twelve men, by the month, or the year. The ox team, this year, was sometimes obliged to lie by, for want of a plowman; and a plow team, in August, is invaluable.

This year, I found the conveniency of employing *active* young fellows. One invalid, or sluggard, would have spoiled the whole set: and this holds good, generally. Mix two or three women, or two or three boys, with a company of men, and a metamorphose will be produced; for the men will, in effect, become women, or boys: complacency, and self indulgence, bid one wait for the other.

MAN: of SERVANTS. If ever I employ WOMEN, in harvest, it must be from a scarcity of men; and it must be from real necessity, if I employ more than two.* Two women, after the first or second day, will do as much work, as half a dozen. By this time their stores of

* Reaping is not, here, a female employment.

scandal being reciprocally communicated, they begin to work for amusement. 244. MAN: of SERVANTS.

If it be necessary, or convenient, to employ a number of both men and women, it is but common good management to keep them separate; with this exception—employ "one man, among women; and one woman, among men."—A crusty, conceited old fellow will check the gossipping of the women; and I have seen a handsome young wench, raking after, animate more than a gallon of ale. Two are dangerous; they breed contention, and rather hinder than forward the business of the day.

In future—endeavor to engage, *before* harvest, ten or twelve able young fellows, for month men; and two or three sets of careful old, or middle-aged men, for reapers. Those will want nothing, but good usage, and ale, to make them willing, in cases of emergency; and these, generally, will do their work better, with less looking after, than strangers, youngsters, women, or boys.

But the most valuable servant, in harvest, is a *good carter*. It is necessary to common management, that he should be able, willing, CARRYING CORN and HAY.

244. CARRYING CORN and HAY.

and careful. Every pitch of hay and corn, generally speaking, passes twice through his hands: he loads and unloads, which are the two most laborious tasks of harvest: he drives the team backward and forward; and if he loiters by the way, the field men or the stackers, must stand idle: if he spill or overturn his load, or if he break his waggon, or set his horses, the arrangement of the day is broken; and, perhaps, the damage done, by the loss of time, rendered irreparable, by the next day's rain.

A good carter will not suffer his waggon to be overloaded. We have, this year, already carried two or three hundred loads of hay and corn, without the least disagreeable accident. I gave strict orders, that nothing above a middling load should be laid on; and, to this, I attribute the success.

The field men, too—(the pitchers and assistant loader) should be young, and active, and match well, with the carters. A less even set will do, for the stack or mow.

245.

SEPTEMBER 8. See 22 Aug. But this cannot be practised, generally. It cannot be practised, except when the barley is free, not only from weeds, but from clover, or other succulent herbage. HARVESTING BARLEY.

Last week, I cut a field, which was purposely let stand, to cut and carry immediately. I knew it to be clear of *weeds*, but was not aware of the *clover*,—which, in places, had got half as high as the barley. Before the succulence of the clover was sufficiently exhausted, to prevent its heating very much in the mow, the barley was caught in the rain; and, being quite ripe, the *color* will be injured.

Yesterday, it is true, we cut, and carried, off two acres of Garden Field, four good loads, in tolerable order; but there was not a weed in the whole piece; and, being intended for cabbages next year, there was no clover.

Here, a disadvantage of sowing clover with barley appears, and threatens my SUCCESSION.

245. SUCCESSION. whole plan of management. How convenient it was, yesterday, to cut Garden Field, and hurry it into stack, immediately! How disagreeable, to turn, and re-turn, the thatch at Adscomb; looking, every minute, as surly and black, at the weather, as the clouds themselves!

But are there no disadvantages attendant, on cutting barley, very ripe? Yes—the color and the quality of the grain are greatly injured, and the quality of the straw, totally spoiled,—though undamped by a drop of rain, after cutting. This is verified, in Garden Field: the straw is rotten, and the grain rough skinned: one skin is peeling off, while a second is forming, under it.

246.

HUNTING. SEPTEMBER 9. Last week, Mr. ——'s hounds came across the standing corn. I desired that they might be kept off the farm, until the corn be off the ground.

This morning, Mr. ——'s huntsman and whipper-in were absolutely trailing, in and round a field of beans and buckwheat, with a field of barley, in swath, adjoining. I

ordered them off; but they presently re- 246.
turned; and I was under the necessity of HUNTING.
sending them away, in a greater hurry, the second time, than the first.

But how is this, Mr. *Farmer?* you, who profess liberality of sentiment,—you, who pretend to be so fond of hunting, too,—you, to behave in this churlish, unsportsmanly manner!

I beg your pardon, Mr. *Monitor.* I confess, I was a little warm; but, on cooler reflection, I do not repent of my conduct; because I did nothing unbecoming a *sportsman.*

And now, while there is still a glow upon the embers, let me endeavor to analyse this first of manly amusements, and to collect and arrange my ideas, so as to form principles of future conduct.

Is hunting *natural?* certainly,—a state of nature is the hunter's state. Were not this obvious, my own feelings, even in this emasculating labyrinth of art, would be sufficient vouchers of it.

But is hunting, *on horseback,* natural? as certainly;—it is natural for hounds to pursue their game;—it is natural for horses,

246. HUNTING. domesticated as they are, to pursue the hounds;—and is it not obviously natural, for man, who is of slower pace, to mount the animal, he sees able to wanton amid the pack, and which is evidently adapted to accelerate his pursuit?

But is equestrian hunting, in a state of PRIVATE PROPERTY, *right?*

On this point, different men will decide differently. If any one man is a judge of the question, it is the sporting farmer; for he is the actor and the acteé.

I will profess myself a sporting farmer: and pronounce it right to hunt, on horseback, in a state of private property;—because it is *political*.*

Men, who live at ease, require amusement. Without recreation, ease and indolence are synonymous. If their amusements are soft, they become effeminate; if athletic, manly. If there is an amusement, which at once makes the body robust, and the mind undaunted, it is HUNTING.—If there is an amusement, which, more than any other, makes men emulous and brave, it is

* The wastes of England, though too many, are too few for general hunting.

HUNTING. An army of sportsmen would be an army of —— I had forgot the profession just made; for I had said to my pen, an army of heroes! 246. HUNTING.

But is it right, that a sportsman should trample, wantonly, on private property? The question is vague. A SPORTSMAN will not; he cannot: he is no longer a *sportsman*, if he injures, voluntarily, more than is necessary to the fair pursuit of the game.

There is an etiquette of the field, as of the drawing room. If a man intrude, on this, he is no gentleman; on that, no sportsman. But the rules of sportsmanliness are not so generally understood, as those of good breeding.

The bounds, between sportsmanly and unsportsmanly, may be difficult to trace, precisely; but there are objects, on each side of the line, which are obviously discriminable.

It is unsportsmanly, to hunt out of season. It is wanton mischief, to hunt, before the crops are off the ground, or after the fences of an inclosed country are made up, and livestock in the fields. The chase cannot be pursued, by *horsemen*, through an

246. HUNTING. inclosed country, after the middle of March, nor before the middle of October, without aggravation.*

A sportsman endeavors to favor a wet-land country; but it is not unsportsmanly to *pursue* game, *fairly*, through any country.

It is unsportsmanly to ride over a valuable vegetable, which may be avoided, by a few yards riding; or to destroy a fence, when a gate is near:—but a brisk chase will sometimes apologize, for these, and many other unavoidable petty mischiefs.

It is sometimes sportsmanly, to suffer the *huntsman*, to pursue the hounds, where it would be unsportsmanly, in any other *horseman*, to follow.

A sportsman invariably rides over another's property, with greater caution, than over his own; and the only fear, he knows, in hunting, is that of injuring the industrious farmer; whom he considers, as the sustaining pillar of human existence: and

* Before this time, the aftergrass, which is a part of the farmer's crop, is still valuable; and the fields are still full of livestock: and, if not *unsportsmanly*, it is, at least, *unneighbourly*, to hunt before this time.

is conscious, that, by wantonly destroying the produce of the soil, he is committing a crime against mankind. 246. HUNTING.

Generally,—it is as unsportsmanly, to do avoidable mischief, to private property, as to cross the huntsman, ride before the hounds, or head the game.

Well, and what rules of future comportment result from these reflections? two very concise ones.

As a sportsman, I will endeavor to do, as I wish to be done by.

As a farmer, I will not suffer any man to trample, unsportsmanly, upon me, with impunity.

247.

SEPTEMBER 14. I began cutting the second crop of clover, as the daggly weather set in: some of it had all the late rains. Being busy with the barley, the clover was neglected; and I gave it up as lost. The weather, however, broke, just as it was all down; and the barley being got in, I paid more attention to the clover. It was all, whether black, yellow, or green, wadded MAKING CLOVER HAY.

247. MAKING CLOVER HAY.

(broken into small tufts, lightly shook up). As the wads became dry, on the outsides, they were turned upon fresh ground, and the lumps carefully opened. As they got nearly dry, they were grouped;—and, after being thoroughly aired, by the afternoon's sun, they were heaped, and carried.

The first mown was but indifferent hay; it rose, however, in goodness, according to the time of mowing; and that, which was last mown, is not the worse for the weather. I mixed the over-done with the under-done, and it takes a very fine heat.

In future,—I will endeavor to wad the second cut of clover, immediately after the mowers, as I did the tare hay: for where the swaths lay thick, the clover saved itself; but, where the swath was thin, it was beaten into the ground, and as black as a hat. Whether the crop be thick or thin, wadding puts it equally out of harm's way.

248.

SEPTEMBER 19. The 18 May (after the first hoing) sowed the headlands of the drilled peas, with buckwheat. ARRANGEMENT of CROPS.

It was cut, today, though much under ripe; for this plot of buckwheat, and a plot of beans, in the same field, are a boy's business to look after.

Backward straggling crops are the bane of September. But for these, my *care of crops* had ended, a week ago: if this showery weather continue, they may hang upon my attention, for a fortnight, or three weeks to come.

And, *in future*, I will not sow *small plots* of anything (except by way of experiment). One barn is, this year, thrown away, on a few peas, a few blendings, a few seed tares, a few purple beans, and a little buckwheat. —Each driblet requires a separate mow, and the barn is not more than two thirds full: I mean, it has not more in it, than two thirds of the number of loads it would have contained, had each end been filled,

248. with *one* sort of grain, *trodden down by a horse.*

BARNING LOOSE CORN. This, alone, makes a considerable difference. One horse, on a mow, is better than almost any number of men.

In future—endeavor not to have less, than ten or twelve acres, of any particular crop. These will fill up the bay of a barn, or make a small stack, and will be an object of attention. Small plots are either neglected, or engross more attention, than they are worth.

249.

SOOT. SEPTEMBER 20. Part of the wheat of B. 3. had a top-dressing, harrowed in with the seed, in autumn (See 16 Aug.); and the whole was sown, in spring, with clover.

CLOVER. Wherever it was meliorated, the clover has hit; but the part, not manured, has totally missed.

WHEAT. The part *sooted* joined to the part undressed; and the difference, in the plant of clover, is obvious. But the *wheat*, as has been said above, was not a whit the better

for it, though upwards of fifty bushels, an acre, were harrowed in with the seed. 249. WHEAT.

250.

OCTOBER 2. The other evening showed for rain. The teams had been plowing for wheat, and I meant to harrow in the seed the next day. BUSINESS of SOWING.

I reasoned thus: if it rain, tonight, we shall not be able to sow, tomorrow morning; at least, not with propriety; the seed will *stick*: and, should even the day prove fine, it will be noon, before we shall get to work;—and, even then, it will be sown over a surface, much inferior to the present fresh plit. Therefore, to evade the risk, I will sow it, this evening; for although it is too late to harrow it in, it will, notwithstanding, be ready for the rain.

It is true, it did not happen to rain: if it had, the seed would, nevertheless, have been deposited in the cells, and fissures, with which a *fresh surface* abounds, but which are closed, by the first shower of rain.

I cannot see any necessity, for the custom

250. BUSINESS of SOWING.

of sending the seed, the seedsman, and the harrowing team, into the field, together; nor for that of deferring to sow, till the whole field be plowed. There is, indeed, a glaring impropriety in it:—the team has to wait, in the yard, to take up the seed, which, ten to one, is not quite ready. The seed is then to be distributed, in the field; and, after this, the carter must stand looking at the seedsman, until he has finished his first cast.

L. 2. has been sown, *at the seedsman's leisure:* when opportunity offered, he carried the seed into the field, upon a leisure horse, and sowed up to the plows. Yesterday morning, the team went, straight from the stable to the field, and harrowed it in,—without stop or delay: and, if experience do not point out an evil attendant, I will ever practise this mode of sowing.*

FORCE of CUSTOM.

Although I pride myself on being a farmer, from SELF EXPERIENCE, this convinces me, that I am not, yet, wholly such. It requires a length of time, to get rid of cus-

* JULY, 1777. Where pigeons, rooks, &c. abound, it may be dangerous; but the Writer has not, yet, experienced any inconvenience.

toms, ever so absurd, imperceptibly imbibed. I have been accustomed to see, in the North of England, and have continued to see, in the South, every man going the same way to work; and, until last Wednesday, I had not conceived, that there was any other way of getting the seed into the ground, than by sending it into the field, with the harrowing team. I was habituated to imagine, that to let the seed lie on the surface, though but for a few hours, was enough to endanger the crop. 250. FORCE of CUSTOM.

This, though petty, is nevertheless, to me, a discovery, which is at least convenient. Sowing was a *business*, which created a bustle, and to which every other business bowed; it now merely fills up the leisure hours of the foreman.

251.

OCTOBER 3. The fallow of L. 1. was gathered into fivebout beds, the last stirring, to get it out of the water's way. We are now reversing these beds, for wheat. There were two teams at work, today. One of PLOWS.

251. PLOWS. the plowmen laid his land sufficiently round, and left his interfurrows sufficiently deep, to keep the wheat dry, during the winter: the other, left his as flat as a table, without sufficient furrows, to carry off the water.

I was certain that the fault lay, in the plow, not in the plowman; for, of the two, the latter was the best. On examining the plows, I found that one of their sterns was considerably *wider*, than the other; the *wide stern* made the *good*, the *narrow stern* the *bad* work. I made their sterns of equal width, and they make work of equal goodness.

In future, gather up a fallow, with a narrow stern, and reverse the lands, for the crop, with a wide one.

252.

SOWING NARROW RIDGES. OCTOBER 5. I have, this autumn, hired a new seedsman. I suspected his abilities, and have, therefore, paid more attention to broad-cast sowing, this season, than I had ever bestowed on it, before.

252. SOWING NARROW RIDGES.

He began, as had ever been the case, to sow two lands, at one cast. This is expeditious, but obviously wasteful;—the interfurrows, sown across, receiving, of course, a considerable portion of the seed.

I ordered him to sow the lands, *singly*.—He got *upon* one of them, and attempted it: but he took up too much seed, at once, and scattered it too wide: filling the interfurrows, on both sides, with it; and, consequently, rather increased than lessened the waste.

I desired him to walk in the *left hand interfurrow*, with his face toward the land to be sown; and to make his cast *diagonally*,—not straight across the land. This gave him a greater scope; and, after a few minutes practice, he made very good work: before night, he walked at the rate of three or four miles, an hour; and, though a young seedsman, made as good work as I would wish for. I apprehend, that a man, walking, in the smooth, open interfurrow, would sow three acres, in less time, with more ease, than one, walking among the rough clods and loose mold, would sow two

252. acres: yet I have never seen nor heard of its being practised.

SOWING NARROW RIDGES.

JULY, 1777. The Writer practised this method of sowing, throughout the wheat seedtime, and his ground was never cropped, so well, with so little seed, nor came, up, so evenly, as it did last year. The extra expence of sowing is about twopence, an acre;—and the saving of seed, as nearly as he can calculate, is about two shillings an acre.

The seedsman walks *up* one side of the bed, and *down* the other side; always keeping his face, and the hand with which he sows, towards the bed he is sowing; his eye is, continually, on the edge of the opposite interfurrow, and he delivers his seed, principally, on the side of the bed next to it: as he returns, the sides are of course reversed, and the beds become evenly seeded.

253.

HEDGES. OCTOBER 13. There are few of the old hedges of this country, without a sufficiency

of live plants in them, if they were properly treated, to make a fence. And I have, this year, attempted to lay down some rules for their treatment. 253 HEDGES.

If the hedge requires to be fresh made, I plash it, in the Yorkshire manner, filling up the vacant places, with the heads of the taller boughs.

Such as do not require to be immediately re-made, I treat in this manner:—with a sharp pea hook, or a common sharp reaping hook (not a sickle), I begin on the *ditch* side, and strike off everything, whether oak, hazel, blackthorn, or maple, dead or living, which overhang the ditch; clearing, at the same time, the bank and ditch, from grass and weeds.

If the *bank* side be free from trees, bushes, or other incumbrances, I treat it in the same manner; leaving the hedge, whether crooked or straight, a foot or more in thickness; according to its age; and clearing away the grass, weeds, and briars, as on the other side.

The immediate neatness, which this gives, is pleasing, and its utility is obvious: there is no waste ground,—no harbour for weeds;

253. HEDGES. —and, where live shrubs abound, the fresh shoots, next spring, will, I should suppose, make an impenetrable fence.*

If the *bank* side is encumbered, I grub, or mean to grub, and plow close to the hedge. For the present, I plow close to the incumbrances, and prune back every thing, which overhangs the last furrow. This alone gives a gardenly appearance, which is worth all the trouble. But even this is not without its use: the nursery of weeds is in a great measure destroyed, and a convenient path is formed round the field.

The farmer who accommodates hunting, will always be favored by a sportsman. I have frequently seen a horseman reluctantly riding over wheat, because he could not keep the outside furrow; without having his brains dashed out, by a bough, or being torn off his horse by thorns and briars.

But the most pleasing reflection is, that all this utility, convenience, and sightliness, is purchased at a trifling expence. Yesterday, I set a young man.—but he is expert, —to prune the ditch side of a rough black-

* For further remarks, on this practice, see MIDLAND COUNTIES, MIN: 131.

thorn hedge, which had not been touched, for many years. The ditch was totally *blinded*, with thorns, briars, grass, and weeds. The length was about sixty rods. He began about eight, and finished about five o'clock. His wages did not amount to more than 15*d.*—or a farthing a perch. And, today, he trimmed back whatever over-hung the outside furrow of a field of wheat, of four acres, in four or five hours. It is true, the labor, here required, was not much: but I can now walk, or ride, round the field, and attend to the coming crop, without injuring it; which, without this sixpennyworth of labor, I could not have done. 253. HEDGES.

254.

OCTOBER 15. I found an exceedingly fine breed of hogs upon the farm. But they were "staggery;" we lost several. Being told, that it was owing to the *breed's being worn out*,—I set about *crossing* it. I saw a fine farrow of the large black spotted "tun-backs," as I passed a farm yard,—and desired that a sow, and a boar, might be saved for me. BREED of SWINE.

254. BREED of SWINE. Under an idea of *hardening* the breed, I I bought a shaggy black boar; not the China sort, but an animal more like a *bear* than a hog.—To these, I accidentally added a thorough-bred Chinese sow.

I have now had near a twelvemonth's trial; and am fully convinced, that the large, long haired, dark spotted, domestic, *English* breed (I know not of what county: they are neither the true Hampshire nor Berkshire) which I found on the premises, is much the most eligible breed:—because it is the *hardiest* and the most *tractable*.

The young *bruins* are as wild as hares: they skulk and burrow, like rabbits in a warren: and it is dangerous to pursue them. One of them laid its skull open, in attempting to run under a gate; and another tore a pound of flesh off its back, by running furiously among some implements.—As they grow up, they become all belly and hip-bones.

The different sorts have been uniformly fed, at the same troughs. While the thorough-bred English looked sleek and fleshy, the half-bred were dirty, raw-boned, and

bare of flesh. And as to the poor Chinese sow (but she had been used to daintier fare); she is barely kept alive. 254.

255.

PLANTING POTATOES.

OCTOBER 27. See 12 April, and 7 May. The result of the experiment, on planting potatoes, *under*, or *upon*, the dung, is in favor of under:—but this may not hold good generally. I apprehend, this preference was, in some part, owing to the *drought;* and we may not have such another remarkably dry spring, for thrice seven years to come.

POTATOE PLANTS.

The result of the experiment on *plants*, is in favor of the large ones. The halm, as well as the roots, from the plugs, were obviously interior. But here, too, the drought might influence. The large plants had intrinsic strength, and moisture sufficient, to support them, until the young fibers got foot-hold; the plugs died in the struggle: and neither of the experiments are decisive; though useful, as evidences.

255. CLEANING FOUL LAND. Finished *digging* them up, today. The soil of the rows was full of couch, and I wanted to get the land ready, for wheat. Scarcely any number of plowings, *at this time of the year*, would have cleansed it, so well, as one digging, and picking.

Taking up the potatoes, and cleansing the soil, fit for the wheat, has cost *5d.* a rod, or £3. 6*s.* 8*d.* an acre.

July, 1777. How vague the idea of cleansing foul land, effectually, from couch, without SUMMER TILLAGE! This plot, notwithstanding the expence bestowed upon it, is still a bed of couch.

256.

STRAW and DUNG. NOVEMBER 9. From twentytwo field loads and a half of oats, put into Woodside barn, we have carried, out of the yard, twentytwo loads and a half of dung; exactly a load of dung, to a load of straw.

I had conceived, that a field load of straw would produce nearer two loads of dung, than one. But I am thoroughly convinced of the contrary; for, with regard to the

quantities carried in and out, there could not have been a more precise observation. 256.

257.

NOVEMBER 15. Last year, eight porkers paid 9*s*. a piece, for fatting. This year, I have fatted fifteen, and sold the last, today. But, instead of a gain, I find, they have incurred a loss! BREED of SWINE.

How is this to be reconciled? They were, both years, fattened on potatoes, with a small quantity of barley meal; and were sold, at the very same rate; and, last year, store hogs were dear, this year, cheap. And there is not any reason, why they, last year, paid 9*s*. and this year lost $1\frac{1}{4}d$. a head, except, that those, fatted, last year, were of the *English*, these, this year, a mixture of the *Oriental* breed.

Last year, on a par, they weighed near eleven stone; this year, not much more than six stone: and yet, if I recollect right, their appearances to the eye, were not much different. But this is to be reconciled by the mongrels having a greater proportion of intrails. See MIN: 254.

257. BREED of SWINE.

JANUARY 28, 1777. This is fully shown, in cutting up the old boar. He has been fatted very highly; and, before he was killed, he was laid at 30 stone. But, now, that his immense paunch is extracted, he weighs no more than 23 stones, 6 lb.

JANUARY, 1799. This base blooded sort is sometimes called the *African*, or the *Negro* breed: it is certainly a vile kind. Nevertheless, there are, in different parts of the kingdom, mixtures of the *English* and the *Chinese* breeds, which are of a good quality.

258.

WORKING CATTLE.

NOVEMBER 16. Today, I dined on the beef of an ox, which pressed the yoke, or collar, upwards of six years, and which was slaughtered, when far advanced, in his tenth year.

He was a very large, coarse-made bullock, and his flesh was, to the eye, coarse; that is, large grained: but without prejudice, I never eat such high, fine, full flavored beef. Though it cannot be called tender, it

is *mellow*, in a high degree, and totally free from toughness. 258. WORKING CATTLE.

Whether its flavor and mellowness are owing to his age and labor, jointly, or separately, or to his being fatted on rich marsh land, I will not attempt to determine; but I can safely say, that I never eat better beef, than that from a ten years old ox, worked six years, and within six months of his being slaughtered, and which was fatted on a salt-marsh.

259.

NOVEMBER 17. Last autumn, I made several experiments, in K. 4. with top dressings, harrowed in with the seed of wheat. But, shame on me! I neglected, at harvest, to make accurate observations, on their results. It is true, I took cursory views, during the summer, but never counted the lands,—never *traced the lines*, till today. And, although the strength and rankness of the stubble be some guide, the experiments are, by no means, so decisive, as they would have been, by a rigid observation, *at harvest*. WHEAT.

259. MANURES. And I dare not draw any general conclusions, from these experiments; except that SOOT, harrowed in with the seed, is of some, but very little, service, to *wheat on clay:* that fifty bushels of dry WOOD ASHES, at 4*d.* is nearly equal to eighty bushels of soot, at 7*d.*: that eighty bushels, an acre, of slaked LIME, harrowed in with the seed, is of no obvious service, to *wheat on clay:* and that it is improper to sow wheat on clay, in the middle of November.

Nor have I a firm reliance, even on these. And again I say, for shame, to neglect so many accurate experiments: for I never took more pains, to make, nor less, to observe the result of, any, than those of K. 4. And yet those of K. 4. are not the only experiments I have neglected.

EXPERIMENTAL AGRICULTURE. Let me endeavor to discover the source of this neglect. My attention has been engaged, by the more immediately necessary minutiæ of farming; and by planning, building, arranging, &c. &c. This, I apprehend, is the principal source; but it is not the only one: I have never had any regular *method* of conducting experiments. I have usually made a memorandum of

259. EXPERIMENTAL AGRICULTURE.

them in the rough field accounts; sometimes, those memorandums have been accurate, and full; sometimes, part has been left to the memory. In this case, the space of time, between seedtime and harvest, was sure to obliterate it; and, even those minuted fully, were so scattered in the field accounts, that many of them escaped notice, until it was too late. Beside, a book is too unportable, to be carried about, in common; and, on a scattered farm, it would take up a great deal of time, to give special attendance, to every stage, of every experiment.

Another cause of neglect was, I made too many, and made them too indistinct: it became a tedious business, to attend to their results.

In order to obviate these inconveniences; and to render, as much as possible, experimenting amusive; I have resolved to esteem it, henceforward, an object of importance, — and to make no experiment, but where there is a great *probability* of its being *decisive*. And, to endeavor to make the observance of the results entertaining, rather than tedious, I have adopted the following METHOD of EXPERIMENTING.

259. EXPERIMENTAL AGRICULTURE.

Instead of making a memorandum, in the check, or the field accounts, I have opened a special REGISTER OF EXPERIMENTS.*

And, beside this book register, I have ascertained the locality of the experiments by *stakes*; so that I have one register at home, and another in the field. If an obvious difference presents itself, a stake is at hand, to explain the cause: whereas, without it, I should have to go home, to my book, and back to the field to reckon the lands, before I could be satisfied; and, ten to one, forgetfulness, or some more immediately necessary business, would render the observation void.

The trouble attending these stakes is trifling; any offal stick, the thickness of a hedge stake, and eighteen inches long, answers the purpose. I sharpen one end, and flatten two opposite sides of the other. The flat sides I chalk, to prevent the ink from running, and, on this, abbreviate the experiment; and, in arable fields, stick them by the sides of the crossfurrows; which I make *wide enough to walk in.*†

* See the form of this register, in the second volume.

† Paint would be preferable to ink, which is liable to be washed out by rains. But writing with paint, *is*

259. EXPERIMENTAL AGRICULTURE.

Conducting experiments is a serious undertaking; and, without *due circumspection*, a dangerous employment: nor is it one, nor two, but a *series of similar results*, that amount to CERTAINTY.

The *weather, manure, tillage, seed, &c. &c. &c.* are joint agents of FACTITIOUS VEGETATION: and on them, *jointly*, depends the goodness, or badness of crops: consequently, to draw a just inference, their joint influence must be attended to. Nor is their agency, annual, nor certain; it may continue one, two, three, or more years: therefore, a cautious *retrospect* is necessary, before an experiment be made; and, when once made, the same spot ought to be avoided, until its influence be worn out.

260.

PLOWMANSHIP.

DECEMBER 12. A good plowman is worth any wages.

Neighbor ——— employed a young lad to plow his clover leys. He tore them up,

too tedious, for common use. Parchment labels are more eligible.

260. PLOW-MANSHIP. with an inclining plow, in rhomboid-shaped slices, of fourteen or fifteen inches wide; leaving the surface, rough, with a mane of grass, on the edge of each plit; and with unequal interstices; which, in some places, gaped five or six inches wide.

An experienced plowman, plowed an adjoining piece, in neat, snug plits, of about nine inches *square*, with a high crest, or crum, and with scarcely an interstice wide enough for a grain of wheat to fall through.

The quantities of seed, sown over these lands, were nearly equal. This had an abundance of plants, which stand regularly, while the surface is as clear as if the soil had been summer fallowed. That, on the contrary, is straggling, and irregular, with large spaces of a foot or eighteen inches diameter, without a blade of wheat upon them; and the surface is uncouth and grassy.

The cause of this disparity is obvious: the large chasms received a great part of the seed; and the prominent parts, which formed these chasms, shedding off that which happened to fall upon them, were of course left destitute; the subsoil receiving what

ought to have lodged on the soil: and part of what did fall to its share, was left uncovered, for want of crum; and, for want of this, much grass appears aboveground. 260. PLOWMANSHIP.

The mode of harrowing, too, might have some influence: his first tine was given by rough harrows, which tore up the plits, and shook still more of the seed down to the subsurface. Our first tine was with fine harrows, which broke the crum, without tearing up the sod; and which covered the seed, without burying it. It was afterwards harrowed, with the rough harrows, without injury; because the plits were broken. It was then finished, with the fine ones: and the effect is sufficient authority, to warrant this method of harrowing wheat, into clover leys, *in future.* HARROWING WHEAT into CLOVERLEY.

261.

JANUARY 6. There are five oxen and two bulls, in Norwood straw yard. Last Monday morning, I began to weigh their fodder (oat straw) and continued it, until this morning; just a week. STRAW and DUNG.

They have eaten seventythree fifty-pound

261. STRAW and DUNG. trusses; or, two loads and one truss: that is, ten trusses and a half, or 520 lb. a week, each.

But the weather is severe, and the straw is not extraordinarily good; it is coarse, and had some wet: they do not *eat* above two thirds of it.

The medial price of such straw is about 18*s.* a load, of 36 trusses; or 6*d.* each fifty pound truss.* Supposing that such a sale load of straw (not a harvest load, see 9 Nov.) makes a load and half of dung, worth at home 9*s.* (or 3*d.* a truss) there is a remainder of 9*s.* (or 3*d.* a truss) for the keep of the cattle. Ten trusses and a half at 3*d.* is 2*s.* 7*d.*½. the neat cost of each cattle a week.

From 1*s.* to 18*d.* a week, is the usual agistment price: full grown oxen are not worth more than 18*d.*

Therefore, if a load of straw, of thirtysix fifty-pound trusses, affords not more, than a load and a half of dung, it is too dear at 18*s.* a load; and it can never answer, to *buy* straw, at that price, for the purpose of rais-

* The ordinary weight of barley and oat straws.

ing manure. At 13*s.* or 14*s.* it might perhaps answer. 261. STRAW and DUNG.

July, 1777. The Writer is clearly of opinion, from repeated observations, that thirtysix fifty-pound trusses will not afford a load and a half of dung.

JANUARY, 1799. The value of the dung is much overrated, in the above calculation. Dung, made from *straw*, is of very inferior value, to that produced from *hay* and *corn*.

262.

JANUARY 19. *Old* cart horses are not worth their meat; especially in winter, while they are at *dry food:* five out of eight, now in work, are as weak, and as poor, as dog horses. It is true, their keep has not been extraordinary, because their work has not been hard; but the three *young* horses are in good spirits, and in very good working condition. CART HORSES.

I am convinced, that, when once a cart horse begins to fail, whenever he is unable to give due mastication to his dry food, it is better management to knock him on the

262. head, than to waste on him corn and hay, as a cart horse.

BEASTS of DRAFT. What shall I do? Shall I sell a team of these, and buy in a team of young HORSES? What! give eighty, or a hundred, or a hundred and twenty guineas, for four horses, which, in six or seven years time, will be in the very state of the jades, I now am plagued with! That would be folly, equal to that of keeping these I have. I will rather give forty guineas, for four capital six years old OXEN, which, after they have worked five or six years, and have been kept at two thirds the expence of horses, will fetch as much, or more, than their first cost. Indeed, it is a management so obviously eligible, and so glaringly preferable to the former, that I will not hesitate a moment on which to choose.

263.

WEATHER. FEBRUARY 19. By what law of nature is the atmosphere governed? We have not had any rain, generally speaking, since last harvest. Springs have not yet begun to rise: deep wells, in general, want water:

and many ponds are not yet filled: even the surface of the earth is not satisfied. I changed the direction of the beds of a very wet field, in autumn, and have not yet been able to ascertain the course of the crossfurrow. 263. WEATHER.

264.

FEBRUARY 20. The middle way is generally the best. Farmers, mostly, have too little live stock. But it is worse to have too much: a farm yard looks comfortable, when it is well littered, and when its inhabitants are sleek and healthy; but wretched, when the dirty starving stock clear the cribs, to stay their hunger. STRAW YARD ECON:

But how is this middle way to be hit? Oxen (See 6 Jan.) eat about 500 lb. a week. I have since found that nine small cows, and one horse, ate, or blowed upon, nine 50 lb. trusses, a day; or each cow about 300 lb. a week; and, perhaps, 400 lb. may be taken as the average quantity of oxen, cows, and horses.

A middling field load of wheat will yield a sale load of *wheat* straw, of 1296 lb.—

264. STRAW YARD ECON: Supposing that a field load of oats, barley, or pulse, produces 1200 lb. of straw, or halm, it will keep one beast three weeks. If the winter is not favorable, there are five strawyard months (from the middle of November to the middle of April); and on this calculation, one head of stock will destroy, near seven loads of fodder.

But this is supposing them to eat but two thirds of it; and, perhaps, a good load, at harvest, will produce more than 1200 lb. and, perhaps, winters, on a par, do not last more than four months and a half. Therefore, perhaps, a cow may be wintered, on a par of years, on four or five, and an ox or horse, on five or six harvest loads of straw or halm.

And, *in future*, by these proportions I will calculate the quantity of strawyard stock, until, from further experience, I can come nearer the truth.

Let me try if something cannot be drawn from this year's experience. The past autumn has been remarkably fine: the yards were not open, till the 12th of December: the cattle were not shut up, wholly, until the 18th: I will, therefore, fix the time of

opening at the 15th. From this, to the 18th of January, we had thirty head of stock, of various kinds, from yearling heifers to ten years old oxen, with four or five horses, in the straw yards. 264. STRAW YARD ECON:

	Head.	Weeks.
From 15 Dec. to 18 Jan. is 5 weeks - -	30	150
And from 18 Jan. to 18 Feb. or $4\frac{1}{2}$ weeks, we had	22	99
Or one head of stock -		249

They have used, in this time, the straw of
11 loads of oats,
45 loads of barley,
6 loads of pulse, of different kinds,

62 loads; or, a load, a month, one with another.

This I am certain is very near the truth: I am perfectly satisfied, without further experiment. They have used it all, in *open yards*. They are healthy, and look well. They have eaten more than two thirds of it.

265.

265.

SUFFLATION.

FEBRUARY 21. See 29 Oct. 1775, and 27 Feb. 1776. Remarkable! The same cow has been again sufflated, by cabbages. Ten cows have been on this food, some days; this cow being one of them. But she was not disordered, till today. Nor was she, now, immediately on *eating*, but a full hour, afterwards: the sufflation was not perceived, until after she came from *water*.

I did not hesitate to give salt and water; but it lodged in the gullet; and, as soon as her head was suffered to decline, the whole was discharged, at her mouth. Oiled the cattle rammer, (See 30 Jan. 1776.) and thrust it down her gullet. Some air, but not much, rushed violently up. Repeated the brine, which now stayed, several times. But she was still blown up to the stretch: much worse than she had been, before. Reinserted the rammer (the first time, it was with difficulty she let it pass her tongue; now, she seemed to open her mouth to receive it), and again drenched her with brine,

and an addition of pepper. After drenching and using the rammer, repeatedly, for upwards of twenty minutes, she began to sink; and, in a quarter of an hour afterward, she was reduced, even below her usual size. 265. SUFFLATION.

There is, probably, something peculiar, in the structure, or habit of body, of this cow; for the other nine, and indeed every cow about the yard, except one or two, have repeatedly eaten their fill of cabbages, with impunity. Nevertheless, there may be some caution requisite, when feeding cattle with cabbages, as well as with turneps. CABBAGES.

266.

APRIL 5. Finished the tare-barley fodder today. See MIN: 230. TARE-BARLEY FODDER.

The oxen have worked hard upon it, almost all this spring seedtime;—the cows, in milk, have had their share;—and the cart horses, theirs. They have all eaten of it, with avidity.

Eight acres yielded ten quarters and a half of grain; but it was only beaten over,

266. not thrashed clean. Some of the tares, too, matured, and I have sifted out as much tare-barley seed (about half-and-half) as has, this year, sown fourteen acres, with three bushels, an acre. The prime barley, with a few prime tares, which remained in the sieve, after the principal part of the tares, and the smaller barley had left it, is excellent horse corn.

TARE-BARLEY FODDER.

I am much pleased that the oxen have done so well upon it. Notwithstanding some weeds, and the strength and reediness of the barley straw, they have eaten it up, very clean; and the *old* oxen have worked every day: but the *young* ones, seldom more, than every second day; and yet I can see but little difference, in their conditions.

WORKING CATTLE.

I begin to look upon THE WORKING OF AGED OXEN as a discovery. What an absurdity, to throw them up, at five or six years old! at an age when they are just *beginning to stand work!* These *young* ones are rising *six;* and yet, in point of standing hard work, they are not to be compared with those rising *eight* or *ten*.

267.

APRIL 14. See 21 May, 1776. I began to practise that method, this year; but it has its inconveniences. The pickers are almost as long employed, in emptying their baskets, as in filling them. Beside, drawing them off is breaking into the day's work of a team. GATHERING STONES.

I think I have, this year, improved it. Seven or eight women, boys and girls, one man, one horse, and a light cart, have run over just forty acres, in three days and three quarters.

Four women at 10*d*. is 3*s*. 4*d*.—four boys or girls, at 6*d*. is 2*s*.—the man, 1*s*. 8*d*.—the horse 1*s*. 5*d*.—wear and tear, 9*d*.—Together, 9*s*. a day,—34*s*. for the forty acres, or 10*d*. an acre, *for picking and carrying off*. This is the utmost cost. It is true, that some of the fields were not foul, but many of them had been composted, and were very full of stones and rubbish.

The pickers, in this practice, have nothing to do, but to fill their baskets; the

267. GATHERING STONES. cart and the man are at hand, to empty them; and a strong horse will draw a great many, to the next hole, slough, or gateway.

268.

DISPOSAL of HAY. APRIL 19. Finished binding meadow hay. Began to cut the stack, the 23 December. From that time, to the 11 February, eight loads were bound. On a calculation of the cubical feet expended, and of the cubical feet remaining, there were, then, full twelve loads, in stack. But the whole, now, amounts to only eighteen loads and a half; and the March winds are debitable for one load and a half.

Last year, a stack of mixed hay, which I had laid, the preceding haytime, at $18\frac{1}{2}$ loads, cut out but 12 loads and 28 trusses; but it was bound, chiefly, during the heat of summer.

Though neither of these observations amount to mathematical certainty, the former comes very near it; and I am determined, *in future*, to endeavor to sell my hay, before the March winds set in; for, generally, I would rather sell hay, in November,

December, January, or the beginning of February (before the hurry of spring seed-time begins) at £3. a load, than in March, at £3. 5s. in April, at £3. 10s. or in the height of summer at £3. 15s. 268. DISPOSAL of HAY.

269.

APRIL 25. My vow to Ceres is performed! It is three years, today, since I first slept, in this house, and three years and a day, since I slept last, in London: nor have I dined in town thrice, nor seen it ten times, during the last two years; though within an hour's ride of it. FARM MANAGEMENT.

My sole EMPLOYMENT, and almost my sole AMUSEMENT, has been FARMING. Day for day, I have now been a practical FARMER, upwards of a thousand days; on which my *sole* attendance and attention, have been duly paid to the profession.

270.

APRIL 26. From Christmas, until lately, the yard hogs have looked remarkably well, YARD HOGS.

270. YARD HOGS. though their *extra* food was trifling: they are, now, shameful to be seen, though they are fed, two or three times, a day.

I was then aware of the cause of their well thriving, and am, now, convinced of it. While they looked well, the oxen eat *tare-barley fodder*, and the horses *unground barley*: for three weeks past, the oxen have been fed on second cut of clover, and the horses on oats and beans.

271.

SPECIES of CABBAGE. APRIL 28. Finished cutting cabbages, last Friday.

The *drum head* "*American*," and the *red Scotch*, stood much the longest. But the American were much larger, than the Scotch; and they are, incomparably, the best farmyard cabbages, I have yet seen. The *savoys* and *sugar loaves* were soon gone. The *green cole* and *brown cole* stood the winter very well; but a whole head is barely a mouthful for an ox. The green and red Scotch, though very hardy, are too small.

The *larger* the cabbage, the *fewer plants* are required, and the *less the labor*, throughout the culture, and the consumption. 271.

The cows and hogs had eaten two thirds of them, before the thought of giving them to the OXEN occurred. But observing, that, while they fetched them in, for the former, they were desirous to partake of them, and the request seeming reasonable, they had a few given them, every evening, when they came from work. After having had them, three or four times, they would not eat their dry meat, until they had eaten, plentifully, of cabbages. They have, therefore, had them regularly, twice a day. They have worked, hard, on these, and ordinary second cut of clover; yet are very hearty: and, WORKING CATTLE.

In future,—I will make a point of giving CABBAGES, to WORKING CATTLE, in SPRING SEEDTIME.

272.

APRIL 28. What useful hints have I gathered during this seedtime? Very few indeed; yet there may be one or two worth memorizing.

272. COURSE of PRACTICE. Fallowing, for spring corn and clover, is most eligible management. The clayey loams of Norwood, and Woodside (the most untoward soils under the sun) worked like a garden; but they were gathered, in autumn, into fivebout beds.

SEED PROCESS. Rolling, immediately after the seed is covered, and then re-harrowing, is an excellent practice: the soil is effectually pulverized; the moisture retained; and the root weeds, on the surface, effectually destroyed. Rolling, immediately, without re-harrowing, is bad management; for the root weeds, which are still alive, are thereby pressed into the very state most helpful to their vegetation: beside, one harrowing, after the roller has *crushed* and *fixed* the clods, is more efficacious than three, while they lie loose on the surface, and move under the harrow: and it is obviously good management, in a dry spring at least, to roll, as soon as possible, after the seed is in the ground.

273.

FARM MANAGEMENT.

JUNE 10. The 5th of last month, after some weeks deliberation, I ventured to set out, on a month's tour; and, with much reluctance, and many apprehensions, dared to leave the farm, to fortune and a bailiff.

I drew up a long list of orders; enumerating, minutely, the business of the farm, to be executed, during my absence; obviating every difficulty, I could foresee; and pointing out a plan of self comportment, to the person entrusted.

I was, nevertheless, apprehensive of the consequences, which must ever attend the management of a servant; and, therefore, while I rode the last stage, I prepared myself to meet, with intrepidity, a phalanx of misfortunes; and I was, thereby, not surprised to find two cows and two swine dead, and the farm overgrown with weeds. The latter I place to a want of self attendance; the former, except one, to the ordinary hazards of farming.

273. WEATHER. I KEPT an account of the weather, during my journey, to compare it with that of this place. The two Journals bear a much nearer affinity, than I expected to have found. The quantity of rain, it is true, is different; but the quality of the weather is nearly the same: for, while there were heavy rains, here, we had showers and drizzly weather; and settled fair weather set in, at both places, at the same time, and with the same prognostic, a hail squall. The circumstances were somewhat remarkable. In the neighborhood of Rochdale, we had a very heavy shower of hail and rain, with thunder, for upwards of forty minutes; while at the distance of a mile on one side, there was no hail;—on the other, neither hail nor rain: yet in the neighborhood of Croydon, two hundred miles distant, there was, at the same, or nearly the same time, a hurricane of hail, thunder and lightning.* After this, there has been a fortnight of universally fine weather; and, perhaps, a HAIL SQUALL in summer, may be considered as a prognostic of settled fair weather.

* The squall, in Surrey, happened about an hour and a half, before the squall, in Lancashire.

273. SURVEY of ENGLISH AGRICULTURE.

HOW very little PRACTICAL KNOWLEDGE in AGRICULTURE is to be acquired, in travelling. I have ridden, on horseback, four or five hundred miles: and, notwithstanding I have been incessantly observant, and frequently inquisitive, I have not picked up more than four or five ideas, worth bringing home.

The real state, and present practice, of English agriculture are earnestly to be desired. But it is not travelling through a district, though ever so inquisitive and observing, which can obtain an adequate knowledge of its practices in agriculture. Perhaps, nothing but TWELVE MONTHS' RESIDENCE is equal to the task.

It is true, that, in six weeks, or two months, a person might gain a competent knowledge of the spring process, for instance; but he would be as ignorant of the summer, and the autumnal, as of the farmyard, and general management.

Perhaps, this is an eligible plan:

Place six, seven, or more proper persons (if such may be found), in the several districts most noted for superior management, and, from their records, draw the

273. present state and practice of English agriculture.

SURVEY of ENGLISH AGRICULTURE.

It is not meant, that these observators of agriculture should be wholly fixed, nor wholly itinerant. Perhaps, let each take his STATION, on the best cultivated spot of his district: here, let him become familiar, with the farmers of the neighborhood; and, here, from repeated observation, and personal practice, let him make himself complete master of the MINUTIÆ; and, by frequent EXCURSIONS, let him learn the more GENERAL MANAGEMENT of his district.

Perhaps, give to each a set of general instructions: but, perhaps, deliver them as hints, rather than as orders; for these might cramp the intention. If one year should be found inadequate, let such, as are imperfect in their intelligence, return to their respective stations, and remain, until they can deliver in ample and true accounts.

JANUARY, 1799. In these reflections originated the plan of survey, which I have since executed.

274.

JUNE 18. Finished stirring the fallow of F. 1. FALLOWING.

This fallow was balked, in November. Part of it was crossed, the 27 January;—part, in May. The whole was equally harrowed and rolled, last week, and was equally stirred, yesterday and today.

This was not an accidental, but a designed experiment; to know whether it is better, to cross a fallow, which has been balked in autumn, (after wheat seedtime) before or after the spring sowing. And, *in this instance*, the experiment is perfectly decisive: the part, crossed *in winter*, is one plowing, at least, *behind* that, crossed *in May*. If a harrowing and rolling be reckoned (and they are as necessary as the plowing, to bring them to an equal state of tillage) ten shillings an acre is not equal to the difference.

July, 1777. This is one of the most decisive experiments the Writer has made. The summer proving very wet, the part,

274. crossed in winter, is still in a backward state; while the part, crossed during the summer vacation, is a forward fallow.

275.

WEATHER. JUNE 23. See 19 Feb. The spring seed-time was moist, but not remarkably wet: the clouds reserved their bounty, for May and June. The middle of May was very wet, and so is the middle of June. The last ten days have been (except one) uniformly rainy. Last night, it poured, for eight or nine hours: perhaps, never more rain fell, in so short a time. The wheats, which were good, are beaten down to the ground; the grass, which is cut, swims in every furrow; and the fallows are ready to flow out of the fields. Lowland pastures are overflowed, and the stock obliged to be taken into the house, to prevent their poaching. Work is at a stand: we cannot make hay, nor even weed. The teams cannot plow; nor can they carry out dung, even when it is fair, with any propriety. The ground was never so wet since the Deluge. The

springs and rivers, only, may rejoice. The poor are starving, for want of work. 275.

Much wheat, which was lately worth ten pounds, an acre, will scarcely, except the weather at harvest prove favorable indeed, be worth harvesting; and clover, which was nearly made, when the rains set in, will be reduced, in its value, more than half, if not totally spoiled: for there are not, as yet, any signs of fair weather: the wind changes, to every quarter, but the weather is invariably rainy. HAZARD of FARMING.

276.

JULY 15. See 23 June. From that time, to the 8th instant, there was scarcely a fair day.—The rain set in, on Friday the 13th of June: it therefore lasted six and twenty days; with scarcely one fair day intervening. WEATHER.

The attendant circumstances were these.

The barometer—hovered about changeable, and seemed to watch the motions of the wind.

The wind—was generally S. W. When-

276. WEATHER. ever it veered round, to the northward, the air got heavy; but as soon as it returned to its old station, the barometer as regularly got back to changeable.

The impotence of the moon was fully proved: she became full, shifted her quarters, and even changed, without the least effect.

We had, frequently, rainbows in the evening, with the same success.

The wind, alone, seemed to rule; for as soon as it was fixed, in the north, the rain ceased; and before it had been eight and forty hours, there, the weather changed, from very cold, for the time of the year, to very hot! The change of the wind was preceded, by a very heavy squall in the night.

HAY MAKING. I BEGAN to mow clover, the day the rain set in, and kept on cutting, until I had finished what I intended for wheat, the ensuing autumn. The crop, in general, was large, and lodged, and must have rotted on the ground, if left uncut.

I wadded it, almost immediately, after the mowers. The wads were repeatedly shifted,

to fresh ground, whenever a favorable blast dried the surface. The second crop was thus greatly relieved, and the hay was preserved, from being totally lost. 276. HAY MAKING.

We began to carry the hay, just a month, after the mowers began to cut it; and yet the fodder is by no means spoiled.—I have made the worst of it (about thirty loads) into two stacks, of equal size, and quality., One of them I have *salted*, with about a bushel (half a hundredweight) of salt, to a market load of hay; the other is unsalted.

Hay which was *made* (but not carried) *when the rain set in*, is totally lost. Quantities have been carried into farm yards, for litter. Many stacks, which were caught half made, have been pulled down, and carried back to the fields, to dry. Lowland meadows have been greatly injured, by the floods. In the lower parts of Surrey and Sussex, numbers of acres were so loaded with sand and mud, the grass has been cut, and carried immediately to the dunghill, to secure a second crop, or the afterpasture; and many hundred loads have been swept away, by the stream. HAZARD of FARMING.

276. PRICES of HAY and CORN.

But these disasters fall on the individuals who suffer the total losses, and on the consumers; not on the farmer, who has got his hay, tolerably well; for that which is lost, will raise the price of that which is saved; and as there will be very little good hay (cultivated hay at least), that which is tolerably good will sell, at market.

It is not with hay, as with corn. The price of corn is regulated, by the crops of Europe and America; but the price of hay is settled, by those which happen to be saved, within the circuit of few miles.

END OF THE MINUTES.

EXPLANATION

OF

TERMS.

A.

To acclivate. To ridge up; to make acclivous; to raise the soil from level to sloping; so as to shed off superfluous rain water.

To adjust. To put the surface of the soil, after it has been sown and harrowed, into the fittest state for maturing the crop. See MIN: 115.

B.

Balking. See MIN: 158.

Burning. Spoken of soils, which are liable to be scorched by the sun, in a droughty season.

C.

Cocklets. Small cocks.

Cómpost. A compound of different manures.

To compóst. To mix or assimilate manures.

Couching. A term, used in different provinces, for the operation of cleaning the soil, from the roots of COUCHGRASS (*criticum repens*);—whether by the harrow, the rake, or the hand.

Crop. The quantity of produce; also a general term for any species of agricultural vegetables.

Crossfurrow. The grip, or water-furrow, which receives the superfluous rain water, from the interfurrows, and conveys it into the ditch, or outlet. See Note to MIN: 60.

D.

To deposite. To lay up, lodge, or place the soil; whether it be in ROUND RIDGES, FLAT BEDS, or ENTIRELY LEVEL.

Dung. See Note to GEN: REM: 352.

F.

Flutes. See MIN: 56.

Furrow. This hitherto vague term of agriculture is divided into plow-furrow; inter-furrow;—cross-furrow;—and plit. See Note to MIN: 60.

H.

Haw. The head, or panicle, of the oat.

Heart. The state of the soil with respect to manure; or, more generally, with respect to vegetable food.

I.

Jag. A small load.

Interfurrow. The trench, or drain, left between two beds or ridges. See Note to MIN: 60.

L.

Ley. Land in a state of herbage;—whether annual or perennial: in opposition to land which is occupied, by corn, or by fallow.

Leying. The process of forming a *ley*. See MIN: 8.

M.

To make,—When applied to hay, is to dry; or rather to dissipate its superfluous sap.

Melioration. See MIN: 233.

Mixgrass, or ley herbage. Any mixture of grasses, cultivated with an intent to produce a perennial ley, or meadow.

P.

Pitch. A forkful: as much hay or corn, as is raised to the load, or mow, at one effort.

Pitcher. He who pitches.

Plit. The portion of soil, which is turned, in the operation of plowing. See Note to MIN: 60.

Plowfurrow. The trench left by the plow. See as above.

R.

Ridglet. A diminutive ridge; more especially one raised by *balking*. See MIN: 158.

S.

Semi-culture. See MIN. 115.

Seed seam. The interstice between two plits, as left by the plow; also the channels made, by fluting, drilling, &c.

To subplow. To run a share through, or below, the soil, without turning it. See MIN: 130.

Subsoil. The stratum of earth, which lies immediately under the cultivated soil; and on which the vegetative stratum undergoes the operations of husbandry.

Succession. The order in which crops, or rather the occupants of the soil, whether arable crops, ley grounds, or fallows, succeed each other.

T.

Tare barley. A mixture of tares and barley.

To tiller. To spread, branch out, or ramify, as corn, in the spring.

Tilth. The state of the soil, with respect to tillage: analagous to *heart*, as it relates to manure.

Tine. Operation of the harrow: thus, a *single tine* is drawing it once over the ground; a *double tine*, or *two tines*, is drawing it twice, in the same place.

Top-dressing. Manure laid on the crop: not plowed into the soil.

Trenching. See a Note to GEN: REM: 286.

W.

Wad. A bundle of hay or corn. See MIN: 247, &c.

Whip-rein plow. A small plow, drawn by two oxen or horses, which are guided and driven, with hempen *reins*, made in such a manner, as to answer the purpose of a *whip*. See GEN: REM: 286.

Winter-proud. This is a provincial phrase, very expressive of the idea it represents. It is applied to wheat, which, in winter, puts on a more splendid appearance, than it is able to support, through the ensuing summer. The soil having exerted itself, too freely, on the infant plants, the ramifications are become too numerous, to be reared, to maturity. The crop, during the spring and early summer, declines, and at harvest, falls short of its neighbor, which, in winter, wore a more humble appearance.

Y.

Yield. The actual produce; particularly the quantity of *grain*, after it has been separated from the *straw* and *chaf*.

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